Level C
Textbook

Produced by members of the TeeJay Writing Group

T. Strang (P.T. Mathematics - Clydebank High School)
J. Geddes (P.T. Mathematics - Renfrew High School)
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Level C Textbook

The book can be used in both Primary and Secondary with pupils who have gained a Level B.

♦ In secondary schools it can be used with those pupils who had already gained a National Test level B in Primary or early Secondary.

• It should prepare pupils to sit maths level C national test, or equivalent, by the end of Primary 4, 5, 6, 7 or by the end of Secondary 1.
• There are no A and B exercises. It basically covers the entire Level C course without the teacher having to pick and choose which questions to leave out and which exercises are important. They all are!
• It covers the important work of level C in ONE textbook.
• It contains a 7 page “Chapter Zero” which primarily revises every topic at level B and can be used as a diagnostic tool. This could be followed by a diagnostic assessment of the work of Level B.
• Non-calculator skills will be emphasised and encouraged throughout the book
• Each topic will have a “Topic in a Nutshell” exercise as a summary.
• Homework is available as a photocopiable pack along with an Assessment pack which can be used topic by topic or combined to form a series of level C cumulative Tests.
• Optional worksheets are available to accompany certain exercises and are marked like this:-

We make no apologies for the multiplicity of colours used throughout the book, both for text and in diagrams - we felt it helped brightened up the pages!!

Tom Strang and Jim Geddes
(August 2004)
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The Characters

TODD FAMILY

Mrs Todd

Mr Todd

Tiddles

Ben Todd

Lucy Todd

Ben's friends
Ravi and Nick

Lucy's friends
Jane and Jemma

Miss Young
(Teacher)

Mr Duff
(Teacher)

TeeJay gratefully acknowledges
the Artwork
by

Susan Fitzpatrick
1. Write the following numbers in words :-
   a 96   b 123  c 459  d 905.

2. Write the following numbers using digits :-
   a sixty two  b seven hundred and fifteen  
   c five hundred and ninety  d eight hundred and four.

3. What number comes :-
   a 10 after 137  b 100 before 379  c 50 after 627  
   d 200 before 820  e 20 before 210  f 300 after 695 ?

4. Write these numbers in order putting the LARGEST first :-
   a 199, 96, 211, 390, 89, 208, 302.  
   b 807, 799, 800, 789, 803, 817, 798, 779.

5. Trace or copy each shape neatly and colour in \( \frac{1}{2} \) of it each time :-
   a  
   b  
   c  

6. Trace or copy each shape neatly and colour in \( \frac{1}{4} \) of it each time :-
   a  
   b  
   c  

Calculators should NOT be used anywhere in this chapter.
7. a To find a half of something what do you divide it by?
b To find a quarter of something what do you divide it by?

8. Lucy bought a chocolate bar for 33p.
a What change will she get from £1?
b What coins might the shopkeeper give her as change?

9. a How many 10 pence can Lucy get in exchange for one 50 pence piece?
b How many 5 pence can Lucy get in exchange for three 20 pence pieces?
c How many 2 pence can Lucy get in exchange for four 10 pence pieces?

10. Find mentally:

<p>| | | | |</p>
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<tr>
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<tbody>
<tr>
<td>a</td>
<td>7 + 3</td>
<td>b</td>
<td>32 + 6</td>
</tr>
<tr>
<td>e</td>
<td>58 − 7</td>
<td>f</td>
<td>21 − 8</td>
</tr>
<tr>
<td>d</td>
<td>130 + 40</td>
<td>g</td>
<td>200 − 100</td>
</tr>
<tr>
<td>h</td>
<td>170 + 40</td>
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</table>

11. Work out:

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<tbody>
<tr>
<td>a</td>
<td>52 + 43</td>
<td>b</td>
<td>29 + 53</td>
</tr>
<tr>
<td>c</td>
<td>77 − 23</td>
<td>d</td>
<td>81 − 74</td>
</tr>
<tr>
<td>e</td>
<td>60</td>
<td>f</td>
<td>90 ÷ 10</td>
</tr>
<tr>
<td>g</td>
<td>63 × 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>28 ÷ 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>18 ÷ 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>21 + 48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>28 + 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>17 − 15</td>
<td></td>
<td></td>
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</table>

12. Find mentally:

<p>| | | | |</p>
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<th></th>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>2 × 7</td>
<td>b</td>
<td>5 × 8</td>
</tr>
<tr>
<td>c</td>
<td>4 × 5</td>
<td>d</td>
<td>3 × 9</td>
</tr>
<tr>
<td>e</td>
<td>10 × 6</td>
<td>f</td>
<td>16 ÷ 2</td>
</tr>
<tr>
<td>g</td>
<td>5 × 3</td>
<td>h</td>
<td>28 ÷ 4</td>
</tr>
<tr>
<td>i</td>
<td>10 × 6</td>
<td>j</td>
<td>5 × 9</td>
</tr>
<tr>
<td>k</td>
<td>18 ÷ 3</td>
<td>l</td>
<td>90 ÷ 10</td>
</tr>
</tbody>
</table>

13. Find:

<p>| | | | |</p>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>51 × 3</td>
<td>b</td>
<td>34 × 5</td>
</tr>
<tr>
<td>c</td>
<td>61 × 10</td>
<td>d</td>
<td>342</td>
</tr>
<tr>
<td>e</td>
<td>10460</td>
<td>f</td>
<td>85 ÷ 5</td>
</tr>
<tr>
<td>g</td>
<td>63 × 4</td>
<td>h</td>
<td>472</td>
</tr>
</tbody>
</table>
14. a Lucy, Ben, Nick and Jane share 84 pence amongst themselves equally.  
How much does Lucy get ?

b A packet contains 10 caramels. The total weight is 450 grams.  
What does each caramel weigh ?

15. a What is the total cost of 3 tyres if each one costs £33 ?

b A nail weighs 9 grams.  
What is the weight of 5 nails ?

16. Round each of these to the nearest 10 :-
   a 63  
   b 77  
   c 44  
   d 19

17. Round :-
   a 43 to the nearest 10  
   b 68 to the nearest 10

18. Find :-
   a $\frac{1}{2}$ of £26  
   b $\frac{1}{2}$ of 68 g  
   c $\frac{1}{4}$ of £16  
   d $\frac{1}{4}$ of 40 kg

19. Ben writes down the following numbers :

   43, 66, 117, 19, 62, 130, 89, 6, 402, 197.

Help Ben by writing down all of the EVEN numbers.

20. Find the next 3 numbers in these patterns :-
   a 3, 6, 9, 12  
   b 5, 10, 15, 20  
   c 80, 70, 60, 50  
   d 13, 23, 33, 43  
   e 2, 5, 8, 11  
   f 77, 66, 55, 44.

21. Draw the next two shapes in each of the following patterns :-

   a  
   b  
   c  
   d

22. Copy the following and fill in the missing numbers :-
   a 6 + ... = 13  
   b 19 - ... = 11  
   c 3 x .... = 21  
   d 30 ÷ ... = 6  
   e ... - 4 = 13  
   f ... ÷ 4 = 6
23. Write down which sign (+, -, x, ÷) is missing here :-
   a 4 .... 6 = 24   b  3 .... 9 = 12   c  18 .... 2 = 16   d  18 .... 2 = 9

24. What numbers are the arrows pointing to ?

25. Put these lengths in order, starting with the SMALLEST :-

   85 cm,   1 m 83 cm,   90 cm,   105 cm,   1 m 6 cm

26. Change :-
   a 3 metres 25 centimetres to centimetres
   b 2 m 56 cm to cm
   c 1 m 8 cm to cm
   d 430 cm to m and cm
   e 207 cm to m and cm.

27. Write the times shown on these clocks.

28. Write out these “digital” times in words :-

   a 06:15   b 11:45

29. Put these in order, earliest first:–

   June 17th,   August 1st,   June 30th   July 23rd.
30. Write the following months in order, **EARLIEST** first:

March, December, January, August, June.

31. What are the mathematical names for these shapes:

   a \hspace{1cm} b \hspace{1cm} c \hspace{1cm} d

32. What are the proper mathematical names for these **solid** shapes:

   a \hspace{1cm} b \hspace{1cm} c \hspace{1cm} d \hspace{1cm} e \hspace{1cm} f \hspace{1cm} g

33. This shape is called a **cuboid**.
    a How many “faces” does it have?
    b How many “edges” does it have?
    c How many “corners” does it have?

34. How many **faces**, how many **edges** and how many **corners** do each of these 2 shapes have:

   a \hspace{1cm} b
35. Which of the following shapes are “good” shapes for tiling:
(covering a page with no gaps)

a  

b  

c  

d  

e  

f  

36. Jane is in the kitchen. She is looking at the kettle. What object would Jane be looking at if:

a  she made a quarter turn clockwise?

b  she made a half turn?

37. Make a copy of this COMPASS ROSE. Fill in the other 3 directions.

38. Look at this grid.

a  Which monster is at Bd?

b  Which monster is 1 box right and 3 boxes up from the monster at Db?
39. Which of the following angles are right angles:

a  

b  

c  

d

40. You may use a mirror here.

In which of the following shapes is the red line a line of symmetry:

a  

b  

c  

d  

e  

f

41. This table gives the hair colour and eye colour of a group of children.

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<th></th>
<th>Hair</th>
<th>Eyes</th>
</tr>
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<td>Black</td>
<td>Blue</td>
</tr>
<tr>
<td>b</td>
<td>Black</td>
<td>Blue</td>
</tr>
<tr>
<td>c</td>
<td>Red</td>
<td>Blue</td>
</tr>
<tr>
<td>d</td>
<td>Brown</td>
<td>Green</td>
</tr>
<tr>
<td>e</td>
<td>Brown</td>
<td>Grey</td>
</tr>
<tr>
<td>f</td>
<td>Black</td>
<td>Green</td>
</tr>
</tbody>
</table>

a Which 2 boys have Black hair?
b One person has red hair. What colour of eyes does this person have?
c How many children have green eyes?

42. A bar graph was drawn showing the eye colour of the whole class.

a Which is the least common colour of eyes?
b How many people have blue eyes?
c How many more people have grey eyes than brown eyes?
Calculators should NOT be used anywhere in this chapter.

### Place Values

In the number :- 4156
- the 4 stands for 4 thousand = 4000
- the 1 stands for 1 hundred = 100
- the 5 stands for 5 tens = 50
- the 6 stands for 6 units = 6

= 4156

### Exercise 1

1. What do the following **digits** stand for in the number 6827 :-
   - a 2
   - b 6
   - c 7
   - d 8 ?

2. What does the 7 stand for in each of these numbers :-
   - a 7382
   - b 6971
   - c 2037
   - d 708 ?

3. Write out the following numbers fully **in words** :-
   - a 562
   - b 708
   - c 9317
   - d 8827
   - e 98
   - f 5030
   - g 8006
   - h 9103.

4. Write the following numbers using **digits** :-
   - a eight hundred and fifty.
   - b seven hundred and five.
   - c seven thousand eight hundred.
   - d six thousand two hundred and four.
   - e five thousand and sixty three.
   - f nine thousand and fourteen.
   - g one thousand two hundred and thirty four.

5. a George’s dad is building a garage at two hundred and fifteen Loan Avenue. Write this number **using digits**.
   - b His friend stays at number 308. Write this **in words**.
6. Put the following groups of numbers in order, (SMALLEST first):-
   a 270, 304, 299, 300, 317, 237, 289, 310, 298.
   b 6054, 6099, 5989, 5045, 6104, 6200, 5897, 6001.
   c
   
   7. Write down the number that comes: -
   a 10 after 350  b 20 after 670  c 300 before 4600
   d 60 before 1490  e 200 after 1470  f 400 before 6500
   g 500 after 1500  h 1000 before 3700  i 4000 before 7200.
   j fifty after six hundred and twenty.
   k six hundred before nine thousand eight hundred.
   l one thousand one hundred before six thousand five hundred.

8. a Ravi’s dad was born in 1958. Ravi was born 30 years later.
   In what year was Ravi born?
   a Ravi’s dad was born in 1958. Ravi was born 30 years later.
   In what year was Ravi born?
   b The Americans put a man on the moon in 1969.
   Jane’s gran was born 40 years before this. In what year was Jane’s gran born?

9. Look at these scales. What numbers are the arrows pointing to?
   a 10  b 90  c 100
   d 20  e 40  f 450  g 500
   h 150  i 200  j 300  k 400
10. What are the readings on these gauges?

a

b

c

d

e

f

11. What are the temperatures on these thermometers?

a

b

c

d

e

f

12. The diagram shows a river with distances (in metres) from the bridge. How far up from the bridge is:

a the tree b the boat c the wigwam?
Add and Subtract Whole Numbers

When adding (or subtracting) numbers make sure you line them up properly

To add :- \(37 + 8\)

To subtract :- \(360 - 70\)

Exercise 2

1. Copy and complete each calculation :-

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<td></td>
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<tr>
<td>b</td>
<td>61</td>
<td>+</td>
<td>7</td>
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<td></td>
<td></td>
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<td>22</td>
<td>+</td>
<td>9</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>d</td>
<td>15</td>
<td>+</td>
<td>8</td>
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<td>p</td>
<td>70</td>
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2. Set these down in a similar way (or try them mentally) :-

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<td>b</td>
<td>7 + 49</td>
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<td>75 + 6</td>
<td>f</td>
<td>8 + 64</td>
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<tr>
<td>i</td>
<td>360 + 80</td>
<td>j</td>
<td>540 + 70</td>
<td>k</td>
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<tr>
<td>m</td>
<td>160 + 50 + 30</td>
<td>n</td>
<td>380 + 40 + 40</td>
<td>o</td>
</tr>
</tbody>
</table>
3. Copy and complete each calculation:-

```
  a   b   c   d
 67   59  46   72
 - 3  - 8  - 7  - 6
```

```
e   f   g   h
 83   48  65   93
 - 5  - 9  - 7  - 6
```

```
i   j   k   l
 18  250 320  450
 - 9  - 7  - 9  - 60
```

```
m   n   o   p
 270 600 830 920
 - 80 - 40 - 90 - 30
```

4. Set these down in a similar way (or try them mentally) :-

```
a   b   c   d
 39   58  42   31
 - 6   7   6   7
```

```
e   f   g   h
 70   94  63   72
 - 8   9  - 10  - 5
```

```
i   j   k   l
 260  490 320  510
 - 40  - 50  - 60  - 90
```

```
m   n   o   p
 720  610  930  700
 - 80  - 60  - 50  - 30
```

5. a A tram in Melbourne has 37 passengers on board.
    At the next stop, 8 passengers get off.
    At the stop after that, 5 passengers get on.
    How many passengers are now on the bus ?

   b It is 46 metres across from one bank of
   a river to the other.
   Jamie swam out 8 metres from one bank
   before losing his trunks.
   How far was he from the other bank ?

   c Sandy saved up £170 and Lynsey saved £90.
   i How much had they saved altogether ?
   ii How much more had Sandy saved than Lynsey ?
d. The ACE Company’s factory is 230 metres high. The SCOTIA BANK building is 80 metres high. How much higher is the ACE building than the BANK building?

e. Lucy’s Uncle Ted is 35 years old. Her Aunt Mary is 6 years younger than Ted. Her Uncle Arthur is 8 years older than Ted.

i. How old is Mary?

ii. How old is Arthur?

iii. How much older than Mary is Arthur?

f. A bird is flying at a height of 820 metres above ground level. A hill is 680 metres high. The bird drops by 80 metres.

i. What is the bird’s new height?

ii. By how much will the bird now clear the top of the hill?

g. An empty box weighs 360 grams. A tube of toothpaste weighs 80 grams. What is the total weight of:

i. the box and 1 tube of toothpaste?

ii. the box and 2 tubes of toothpaste?

iii. the box and 5 tubes of toothpaste?

6. Find the value of the * each time:

<table>
<thead>
<tr>
<th>a</th>
<th>6 * + 8</th>
<th>b</th>
<th>5 * + 6</th>
<th>c</th>
<th>4 * + 9</th>
<th>d</th>
<th>3 8 * + 4 4</th>
</tr>
</thead>
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<td></td>
<td>7 2</td>
<td></td>
<td>6 3</td>
<td></td>
<td>5 8</td>
<td></td>
<td>4 4</td>
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</table>

<table>
<thead>
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<th>5 * - 7</th>
<th>f</th>
<th>6 * - 5</th>
<th>g</th>
<th>9 * - 9</th>
<th>h</th>
<th>8 3 * - 7 6</th>
</tr>
</thead>
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<tr>
<td></td>
<td>4 4</td>
<td></td>
<td>5 9</td>
<td></td>
<td>8 3</td>
<td></td>
<td>7 6</td>
</tr>
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<table>
<thead>
<tr>
<th>i</th>
<th>3 * 0 + 4 0</th>
<th>j</th>
<th>5 * 0 + 9 0</th>
<th>k</th>
<th>7 8 0 * 0 + 8 2 0</th>
<th>l</th>
<th>1 6 0 * 0 + 2 4 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 1 0</td>
<td></td>
<td>6 0 0</td>
<td></td>
<td>8 2 0</td>
<td></td>
<td>2 4 0</td>
</tr>
</tbody>
</table>
7. a A box should have 36 chocolates inside. When Lucy looked at the box some were missing. There were 28 chocolates in the box. How many chocolates had been taken?

b The library is 820 metres from my house. I was walking to the library when I stopped because I had forgotten my library card. I was 750 metres from the library. How far had I walked?

Triangle Puzzles.
In these “Triangles” the number in the rectangle is found by adding the numbers in the 2 circles either side of it.

8. Copy the following number triangles and fill in the missing numbers :-

- a
- b
- c
- d
- e
- f

* very difficult

W'Sheet 1·1
1. What does the 4 stand for in each of these numbers? 
   a) 407  
   b) 2164  
   c) 5649  
   d) 4287?

2. Write these numbers out fully in words:
   a) 57  
   b) 321  
   c) 4008  
   d) 7942.

3. Write the following numbers using digits:
   a) six hundred and thirty.  
   b) four thousand nine hundred.  
   c) three thousand and one.  
   d) two thousand five hundred and twenty.

4. Put the following groups of numbers in order, (put the LARGEST first):
   3087, 3021, 2998, 2415, 3002, 3200, 2899, 3004.

5. The hit “You’ve found that Lovin’ Feeling” was No. 1 in the charts in 2002. The same record, sung by a different artist, was a No. 1 hit twenty years before that.
   What year was that?

6. Look at the following scales, gauges and thermometers.
   What numbers or temperatures are shown on each:

   ![Scales and Gauges Diagram]
7. Set down these additions and try them :-

\[
\begin{array}{llll}
\text{a} & 33 & \text{b} & 460 \\
+ 8 & & + 70 & \\
\hline
\text{c} & 50 & \text{d} & 340 \\
+ 9 & & + 70 & \\
\hline
\text{e} & 57 + 9 & \text{f} & 470 + 50 \\
n & 140 + 30 + 80 & \text{h} & 270 + 90 + 42.
\end{array}
\]

8. Set down these subtractions and work out the answers :-

\[
\begin{array}{llll}
\text{a} & 59 & \text{b} & 35 \\
- 6 & & - 7 & \\
\hline
\text{c} & 480 & \text{d} & 530 \\
- 60 & & - 90 & \\
\hline
\text{e} & 47 - 6 & \text{f} & 83 - 9 \\
n & 680 - 330 & \text{h} & 810 - 50.
\end{array}
\]

9. Sally has 28 walnuts. She gives 9 of them to her friend Tony. Her other friend Cindy then hands 4 walnuts to Sally.

How many walnuts does Sally have now ?

10. Joe earns £21 per week for doing a paper round.
Georgie gets £3 less than that for her paper round but Francis gets paid £5 more than Joe.

a What does Georgie earn ?

b What does Francis earn ?

c How much less than Francis does Georgie earn ?

11. Find the missing value in each of the following.
The missing number is shown as a □.

\[
\begin{array}{llll}
\text{a} & \square & \text{b} & 490 \\
+ 9 & & + \square & \\
\hline
\text{c} & 8\square & \text{d} & 310 \\
- 7 & & - \square & \\
\hline
\end{array}
\]

12. I was taking part in a 400 metre race.

One of my running shoes flew off 165 metres from the finishing line.

How far had I ran before my shoe split ?
Line Symmetry

A shape has a line of symmetry if:— when you fold the shape over the line the 2 halves exactly match.

Each shape above has a line of symmetry (shown in red).

Exercise 1

1. Which of these shapes have a line of symmetry?
   (Write YES or NO for each)

   a
   b
2. Draw (or trace) each shape **carefully** into your jotter and mark any lines of symmetry.
Symmetry

e    f
  g    h
i    j
  k    l
Some shapes have more than 1 line of symmetry.

A rectangle has 2 lines of symmetry.  
A square has 4 lines of symmetry.

3. How many lines of symmetry does each shape have? –

a  

b  

c  

d  

e  

f
4. Copy each shape as carefully as you can.

Draw in all lines of symmetry using a coloured pencil.

a  

b  

c  

d  

e  

f  

g  

h
5. How many lines of symmetry does each of these shapes have:

- a
- b
- c
- d
- e
- f
- g
- h
- i
- j
- k
- l
Making Symmetrical Shapes

If you are given half a symmetrical shape with a line of symmetry shown, it is fairly easy to draw the other half.

Exercise 2

1. Copy each shape onto squared paper. Draw the other half using the green line as a line of symmetry.
2. These are much harder.

Copy each figure and complete it so that the blue line or blue lines become lines of symmetry:

- a
- b
- c
- d
- e
- f
1. Explain in your own words what is meant by a **line of symmetry**.

2. Copy each shape in your jotter and mark any lines of symmetry:

   a)
   b)
   c)

3. Copy each shape and draw the other half using the **red** line as a line of symmetry:

   a)
   b)
   c)

4. How many lines of symmetry do each of these shapes have?

   a)
   b)
   c)
   d)
   e)
   f)
The Value of Money

Calculators should NOT be used anywhere in this chapter except in the final exercise.

Exercise 1

1. How many 1p pieces have the same value as :-

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<td>g</td>
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<td>i</td>
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</table>

Example 1. is the same as

Example 2. is the same as

Example 3. a Change 450p into £’s and pence - £4 and 50p or £4·50  
           b Change £1·32 into pence - 132p

Here are the coins which we use today.
2. How many 5p pieces will I receive for :-
   a  
   b  
   c  
   d  
   e  
   f  

3. How many 10p pieces should I get for :-
   a  
   b  
   c  
   d  
   e  
   f  

Nick has                Jemma has

Altogether they have 35p.

4. What does each pair of children have altogether ?
   a  Brian and Charlotte
   b  John and Sadie
   c  Peter and Anne

5. Lucy bought a packet of gum for 15p.
   She found that she only had to use TWO coins to pay for the gum.
   Try to use only TWO coins to pay for the following items.
   If you find that TWO is not enough, you may use THREE coins, but no more !
   a  pencil 6 p
   b  sweets 22p
   c  comic 30p
   d  milk 70p
   e  bread 80p
   f  magazine £1·11.
6. How many £1 coins should I get for: -
   a 300p  
   b 500p  
   c 800p  
   d 900p  

7. How many 1 pence coins will I receive for: -
   a £1  
   b £5  
   c £8  
   d two £2 and three £1  

8. Change the following into pounds (£’s) and pence (p) (215 p = £2 and 15p)
   a 140p  
   b 247p  
   c 364p  
   d 107p  
   e 999p  
   f 205p  
   g 36p  
   h 2p.

Add and Subtract Money

Addition and Subtraction

When you add or subtract money, it is important to line up the decimal points.

Examples

Addition

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78p – 13p

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£2·84 + £1·52

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£8·35 - £5·42

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Exercise 2

1. Write the following as pounds (£’s).

   for example: - 2 pounds and 45 pence = £2·45.
   
   a 6 pounds and 13 pence.  
   b 4 pounds and 62 pence.  
   c 5 pounds and 78 pence.  
   d 3 pounds and 2 pence.  
   e 29 pence.  
   f 3 pence.
2. **Copy and complete**:

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<tr>
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3. **Copy and complete**:

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<tr>
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<td>- £4·35</td>
<td>- £8·75</td>
<td>- £12·55</td>
</tr>
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</table>
4. Ravi bought a can of cola for 55p and a packet of crisps for 32p. How much did this cost him in total? (set down like Question 2)

5. Lucy bought a packet of lollies for 37p and paid for it with a 50p coin. How much change did Lucy get?

6. Joe paid 87p for a pen. He handed the shopkeeper a £1 coin. How much change did Joe receive?

7. Sally spent 80p on her bus fare and 30p on a comic.
   a) How much did this come to in total?
   b) What change did Sally get from a £1 coin and a 50p coin?

   a) How much did the burger and fries cost?
   b) What change did Zoheb get from a £2 coin?

9. Nick went to a football match. He paid £5.20 to get in and bought a programme for £1.50.
   a) How much was this in total?
   b) What change did Nick get from a £5 note and a £2 coin?

10. Cindy handed over a £5 note to pay for her make-up. She got a 50p coin and two 10p coins in her change.
    a) How much was her change?
    b) What was the cost of Cindy’s make-up?

11. Ben buys a cooked breakfast.
    Bacon & Eggs £1.25, Mushrooms 40p, Toast 25p and Fresh Orange Juice 80p.
    a) What is the total cost of Ben’s breakfast?
    b) He only has two £1 coins and one 50p coin with him. Will this be enough? Explain!

12. Mr Barnes paid £17.88 for fish suppers for his family.
    a) How much change did he get from a £20 note?
    b) Give an example of what coins he might have had in his change.
Mixed Money Problems

Money and the Calculator

Be careful with these:

The amount of money shown on this calculator is £4·20
(£4 and 20 pence)
NOT £4·02

The amount of money shown on this calculator is £4·02
(£4 and 2 pence)

Example: Brenda and her mum went swimming.
The cost was £2·64 for mum and £1·38 for Brenda.
What change was left from £5?

Answer:
[Set down £2·64 + £1·38 in your jotter] (now use your calc)

£2·64 + £1·38 = £4·02

[Now show £5 – £4·02 in your jotter] (use your calc again)

£5 – £4·02 = £0·98 change.

Exercise 3

1. A service charge is always added to the bills in Cafe Carlo.
   Find the total bill in each case:
   a
   
   CAFE CARLO
   meal for two = £17·60
   service charge = £2·40
   Total =
   b
   
   CAFE CARLO
   a la carte for one = £12·75
   service charge = £1·95
   Total =

2. Set down each bill and work out the total cost of these items:
   a
   
   eggs .................... 80p
   bacon ................  £1·40
   cheese ............... £2·30
   milk ................... 60p
   
   £
   b
   
   apples ...................... 65p
   oranges .................. £1·75
   pears ..................... £2·60
   pineapple .............. £3·95
   
   £
3. Lucy’s mum bought a skirt reduced in a sale by £4·50. The price of the skirt before the sale was £16·99. What did Lucy’s mum pay for it in the sale?

4. Lucy’s mum bought a blouse in the sale. It had been reduced by £2·36. What was the price of the blouse before the sale started?

5. Hamish went to the ice rink. He hired skates for £1·75 and paid £2·20 to go on the ice.
   a. How much did it cost Hamish altogether to go ice-skating?
   b. Hamish’s grandma gave him four £1 coins to pay for his day out. How much money did he have left once he had paid for his skating?

6. Mr James bought two trays of bedding plants costing £6·44 and £9·75. Calculate:
   a. the total cost.
   b. the change from £20.

7. Jane buys a railway ticket for £6·84 and a £3·98 magazine to read on the train.
   a. What is the total cost?
   b. She had a £20 note to start with. How much change will she have left?

8. Lucy’s mum gave her a £5 note and two £1 coins. If she bought a toy racer for £4·98 and paid £0·27 for the wrapping paper, how much had Lucy left?

9. Trish bought eye make-up for £4·20, hair conditioner for £5·55 and face cream for £3·79. How much change did Trish get from three £5 notes?
1. How many 1p pieces will I get for :-
   a
   b
   c

2. How many 5p pieces should I receive for :-
   a
   b
   c

3. How many 10p pieces will I receive for :-
   a
   b
   c

4. How many £1 coins will I get in exchange for :-
   a 400p  
   b 700p  
   c 1000p ?

5. How many 1p coins will I get for :-
   a £3  
   b £7  
   c two £2 and five £1 ?

6. Change the following pence into pounds (£’s) and pence (p) :-
   a 120p  
   b 52p  
   c 217p  
   d 903p.

7. Write the following as pounds, (example :- 1 pound and 20 pence = £1·20)
   a 4 pounds and 12 pence  
   b 7 pounds and 6 pence 
   c 41 pence  
   d 9 pence.
8. **Copy** and complete each calculation:

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<thead>
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</thead>
<tbody>
<tr>
<td>a</td>
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<td>b</td>
</tr>
<tr>
<td></td>
<td>+ £0.63</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>£0.98</td>
<td>e</td>
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<tr>
<td></td>
<td>- £0.58</td>
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<tr>
<td>g</td>
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<td>+ £1.60</td>
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<td>j</td>
<td>£2.50</td>
<td>k</td>
</tr>
<tr>
<td></td>
<td>- £1.10</td>
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</tbody>
</table>

9. Sidney paid **£2.70** for a kebab and **90p** for vegetables.
   a. How much did the kebab and vegetables cost **in total**?
   b. What change did Sidney get from a two pound coin and two £1 coins?

10. Doreen bought an inflatable crocodile in Blackpool. It cost **£18.82**.
    a. How much change did she get from a £20 note?
    b. List the coins she may have received in her change.

11. A shirt and tie set was reduced in a sale by **£8.95**.
    If the price of the set **before** the sale was **£18.50** what was the price of the shirt and tie during the sale?

12. Richard found that the price he paid for his train ticket this week was **£0.85 cheaper** than last week.
    Richard paid **£3.60** this week. What must the cost of his ticket have been last week?

13. I set off for my school disco with **three £1 coins** and a **50p coin** in my purse.
    At the disco I bought 2 bottles of water at **75p** each, 1 packet of crisps at **34p** and a lollipop at **20p**.
    It also cost me **£1.25** to get into the disco.
    How much money did I return home with?

---

**this is Chapter Three**
The Clock Face

The BIG hand on the above clock points to 9.
The small hand is approaching 5.

The time is "quarter to 5".

Exercise 1

1. Use these words, ... o'clock quarter to ... half past ... quarter past ...

This clock face shows a time of "20 past 7".
2. Write down the times on these clock faces:

\[
\begin{array}{cccc}
\text{a} & \text{b} & \text{c} & \text{d} \\
\end{array}
\begin{array}{cccc}
\begin{array}{cccc}
11 & 12 & 1 & 2 \\
10 & 9 & 8 & 7 \\

\end{array} & \\
\begin{array}{cccc}
3 & 2 & 1 & 0 \\
4 & 5 & 6 & 7 \\

\end{array} & \\
\begin{array}{cccc}
11 & 12 & 1 & 2 \\
10 & 9 & 8 & 7 \\

\end{array} & \\
\begin{array}{cccc}
3 & 2 & 1 & 0 \\
4 & 5 & 6 & 7 \\

\end{array}
\end{array}
\]

Usually, times can be given in more than one way.

The time on this clock is given as:

\[3\cdot40\] or \[20\text{ to }4\].

3. Write down the times on these clock faces in 2 ways:

\[
\begin{array}{cccc}
\text{a} & \text{b} & \text{c} & \text{d} \\
\end{array}
\begin{array}{cccc}
\begin{array}{cccc}
11 & 12 & 1 & 2 \\
10 & 9 & 8 & 7 \\

\end{array} & \\
\begin{array}{cccc}
3 & 2 & 1 & 0 \\
4 & 5 & 6 & 7 \\

\end{array} & \\
\begin{array}{cccc}
11 & 12 & 1 & 2 \\
10 & 9 & 8 & 7 \\

\end{array} & \\
\begin{array}{cccc}
3 & 2 & 1 & 0 \\
4 & 5 & 6 & 7 \\

\end{array}
\end{array}
\]
The Digital Clock

It was in the 1980’s that digital clock displays were invented.
This display shows a time of 10:15 or quarter past ten.

Exercise 2

1. Write each of the following digital clock times in words:–
   a. \[2:30\]  b. \[3:45\]  c. \[6:15\]  d. \[8:50\]
   e. \[7:20\]  f. \[9:40\]  g. \[12:55\]  h. \[1:35\]

2. Draw a small digital clock face for each of these. Write each of the times in digital form:–
   a. \[\frac{1}{4}\] to 6  b. 20 to 8  c. 5 to 6  d. \[\frac{1}{2}\] past 7
3. Write each of the following times in 2 ways:

a b c d

1 2 3 4

5 6 7 8

9 10 11 12

a.m. and p.m.

Each day is divided into 2 “halves”.

before - noon (ante-meridian (am))

after - noon (post-meridian (pm))

Most people start school at about 9·00 am.
Most people have their tea at about 5·00 pm.

The time on the clock opposite shows

“\(\frac{1}{4}\) past 8 at night or 8·15 pm”

supper-time
Exercise 3

1. Write each of the following times in 2 ways (Remember to use am or pm):–

   - **a** in the morning
   - **b** just before lunch
   - **c** bedtime
   - **d** on way to school
   - **e** just after tea
   - **f** morning break
   - **g** late at night
   - **h** school stops
   - **i** Sunday morning church
   - **j** wake up early
   - **k** film starts at night
   - **l** coach turns into pumpkin

2. Write each of the following times using am or pm.
   (for example, "8.20 am" or "7.55 pm"):

   - **a** Nick fell off his bike at \( \frac{1}{4} \) past eight last night.
   - **b** Ben had a big Maths test which started at \( \frac{1}{4} \) to eleven and ended at half past eleven.
   - **c** My favourite T.V. programme lasts from twenty five past seven till twenty to nine and then I go to bed.
d  I was allowed out to play just after I finished my lunch at **ten to one**.

e  My plane left Edinburgh airport at **ten to seven** and arrived in London at **five to eight**. I then had breakfast.

f  My dentist appointment was just after school at **twenty to four**. I did not get home till **twenty five past five** that night.

7:45 am can be written as “quarter to 8 in the morning”.

3. Write each of the following times out fully:
   (use “in the morning”, “in the afternoon” or “at night”)

   a  **2:30 pm**
   b  **9:45 am**
   c  **10:50 pm**
   d  **6:10 am**

   e  **7:52 pm**
   f  **11:55 am**

   i  **11:55 am**
   j  **noon**
4. Shown is a bus timetable.
   The bus is at Lugden at “quarter to 11 in the morning”.
   Write the other 4 bus times out fully in words.

5. Make a neat copy of this train timetable.

Bremley —> Adley —> Newton —> Elton —> Findly
9:55 am  11:05 am  ........  2:10 pm  ........

   a  At what time was the train at Bremley?
   b  At what time was the train at Adley?
   c  The train arrived at Newton at 25 to 2 in the afternoon.
      Write this (using am/pm) in your timetable.
   d  Write out in words when the train was at Elton.
   e  The train journey ended at Findly at five to three in the afternoon.
      Write this in your timetable (using am/pm).

6. Ravi and his dad arrived at the circus at 6:50 pm.
   Were they late or early?

7. EASY-AIR
   Flight Departures

   Malaga  10:55 am
   Palma    11:40 am
   Barcelona 12:35 pm
   Ibiza    1:05 pm
   Tenerife 2:50 pm
   Nice     3:20 pm

   Lucy’s mum is checking her flight times.
   The plane for Malaga leaves at 5 to 11 in the morning.
   Write the other departure times in a similar way.
8. Jane writes lots of times on pieces of card.

Sort out the cards for her.

Copy them out in order, with the earliest time first.

\[
\begin{array}{c}
\frac{1}{4} \text{ to } 12 \\
in \text{ the morning}
\end{array}
\]

\[
\begin{array}{c}
5 \text{ to } 10 \\
in \text{ the afternoon}
\end{array}
\]

9. Nick was looking at Channel 6’s T.V. programmes for Tuesday.

a Dosie and Jen are on at 3:05 (five past 3).

Do you think this is in the afternoon or early morning?

b Royal Ascot is on at 25 past 3 in the afternoon.

Write out the times of the following programmes fully in a similar way:

i Count-Up

ii Neighbours At Home

iii Sports Roundup

iv News In Brief

c Nick was watching Channel 6 at 5 past 4.

Which programme must he have been watching?

d Which programmes are showing on Channel 6 at:

i 5:35 pm

ii 7:50 pm

iii \( \frac{1}{4} \) past 8 at night?
Time Intervals

Let us look at the minute hand of the clock. There are 60 minutes in 1 hour. If the clock time changes from 10 past 11 to 25 to 12, the hand has moved from:

11:10 → 11:35

Can you see that the minute hand has moved through 25 minutes?

Exercise 4

1. How many minutes is it from:
   a) 10:30 till 10:45  
   b) 9:25 till 9:45  
   c) 8:10 till 8:40  
   d) 7:25 till 7:50  
   e) 3:05 till 3:45  
   f) 4:10 till 4:45  
   g) 10:30 till 11:05  
   h) 9:45 till 10:10?

2. Gone to Lunch  
   Back at

   This sign, outside the library, showed when the librarian closed for lunch. How long was her lunch break?

3. How many minutes is it from:
   a) 8:15 to 8:35  
   b) 10:20 to 10:55  
   c) 7:30 to 8:10  
   d) 9:10 to 9:22  
   e) 7:25 to 7:38  
   f) 6:05 to 6:51?
4. Ben went for a nap.  
For how long was Ben asleep?

5. Tony was training for the London marathon.
He checked his watch before he started his run and again when he finished.
How long did Tony train for?

6. Brian's school lunch-break is from 10 to twelve till 25 to one.
How long does his lunch break last?

7. The Loch Trindle Paddle Steamer goes round the loch, calling at different places.
How long did it take the boat to travel from:
   a. The Harbour to Browlie?
   b. Browlie to Cape Tong?
   c. The Harbour to Cape Tong?
   d. Port Rush to Mendolay?
   e. Mendolay to the Harbour?

8. Lucy left her house at 5:15 pm, and jogged for 20 minutes to the station.
At what time did she arrive at the station?

9. Write down the time which is:
   a. 15 minutes after 3:40 pm
   b. 25 minutes after 2:25 am
   c. 40 minutes after 8:50 am
   d. 20 minutes before 6:45 pm
   e. \( \frac{1}{4} \) of an hour before 8:30 am
   f. \( \frac{1}{2} \) of an hour after 5:50 pm
   g. 50 minutes after 7:05 am
   h. \( \frac{1}{2} \) of an hour before 12:00 noon.
10. Part of a rail timetable from Glasgow to New Cumnock is shown.

<table>
<thead>
<tr>
<th></th>
<th>Train A</th>
<th>Train B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glasgow</td>
<td>9:53</td>
<td>11:03</td>
</tr>
<tr>
<td>Barrhead</td>
<td>10:05</td>
<td>11:15</td>
</tr>
<tr>
<td>Dunlop</td>
<td>10:25</td>
<td>11:27</td>
</tr>
<tr>
<td>Stewarton</td>
<td>10:29</td>
<td>11:31</td>
</tr>
<tr>
<td>Kilmarnock</td>
<td>10:34</td>
<td>11:36</td>
</tr>
<tr>
<td>Kilmarnock</td>
<td>11:37</td>
<td>11:41</td>
</tr>
<tr>
<td>Auchinleck</td>
<td>11:55</td>
<td>12:03</td>
</tr>
<tr>
<td>New Cumnock</td>
<td>11:03</td>
<td>12:11</td>
</tr>
</tbody>
</table>

a Train A leaves Glasgow. Where does it first stop at?

b How long did train A take from:
   i Glasgow to Barrhead?
   ii Barrhead to Dunlop?
   iii Kilmarnock to Auchinleck?

c How long did train B take from:
   i Glasgow to Dunlop?
   ii Glasgow to Kilmarnock?
   iii Barrhead to New Cumnock?

11. Mr Todd’s train leaves the station at 10·05 am. He leaves his house at 9·25 am. It takes him 35 minutes to walk to the station. Will he catch his train if it leaves on time?

12. Jane left for school at 8·20 am and arrived at 8·53 am. Lucy left for school at 8·13 am and arrived at 8·49 am.

   a How long did Jane take to reach school?
   b How long did Lucy take to reach school?
   c By how many minutes was Lucy slower than Jane?

13. a It is now 7·45 pm. What was the time 1 hour ago?
   b Lucy’s watch shows 4·20 pm. What was the time $\frac{1}{2}$ an hour ago?
   c Mr Duff’s plane left at 9·40 pm. He had to get to the airport 2 hours before take-off. At what time did he get there?
   d My boat journey took exactly 4 hours. If I arrived at my destination at 11·25 pm, at what time must my boat have left?
Calendars

You should know that there are 365 days in a year *.

This rhyme helps to remember the number of days in each month.

* leap years have 366.

They occur every 4 years.

30 days has September, April, June and November.
All the rest have 31, excepting February which has 28 days clear
and 29 in each leap year.

Exercise 5

1. a What is the 1st month of the year ?
   b What is the last month of the year ?
   c Which month comes just after July ?
   d Which month comes just before May ?
   e Write down all 12 months in the correct order.

2. How many days are there in the month of :-
   a January  b February  c April  d June
   e August   f October  g November h December ?

3. What is the :-
   a 6th month  b 3rd month  c 10th month  d 8th month ?

The date, 3rd of January 2004

3rd January, 2004 = 03 : 01 : 04 or 03/01/04

day month year

4. Write each of these dates using 6 digits as above :-
   a 23rd February 2004  b 19th April 2003
   c 22nd July 2004      d 18th August 1997
   e 7th June 1985       f 3rd March 1988
   g 10th December 2002  h 1st January 2001
**Topic in a Nutshell**

1. Write down the times on these clock faces.
   (for example: “twenty past four”).

   ![Clock Faces](image1)

2. Write down the times on these clock faces in **two** ways.
   For example - “twenty past four” and “4·20”.

   ![Clock Faces](image2)

3. For each of these clocks, draw a small digital clock face and put in the correct time in **digital form** :-

   ![Digital Clocks](image3)
4. Write each of the following times in two ways:-

1st way - “half past eight at night”. 2nd way - “8·30 pm”.
*Remember - morning am, afternoon/evening pm.

5. Rewrite Charles’ story about his school day, using am/pm style:-

“I got up this morning at quarter past eight.
I arrived at school at five to nine and stopped work for my break at ten to eleven.
Lunch was at 1 o’clock until ten to two.
I left school at twenty five to four and arrived home at quarter past four.”

6. 2·30 pm is “half past two in the afternoon” What is :-
   a  8·30 pm  b  6·15 am  c  10·50 am  d  11·25 pm ?

7. Make a neat copy of this bus timetable.

```
Largs ➔ Johnstone ➔ Paisley ➔ Ralston ➔ Govan
11·20 am  12·15 pm  ........  12·40 pm  ........
```

   a  What time did the bus leave Largs ? (answer - “.... in the ......”)
   b  How many minutes after noon did the bus reach Johnstone ?
   c  The bus arrived at the Paisley boundary at 25 past twelve.
      Write this time in your timetable in am/pm form.
   d  Write out in words the time when the bus reached Ralston.
   e  The bus arrived in Govan at quarter past one in the afternoon.
      Write this time in your timetable in am/pm form.
8. How many minutes is it from :-
   a  5:10 am till 5:35 am  
   b  7:20 am till 7:55 am
   c  3:18 pm till 3:25 pm  
   d  11:02 pm till 11:53 pm
   d  11:25 am to noon  
   e  7:15 pm to 9 pm

9. It takes Dr Jones 20 minutes to reach the hospital from his house.
   He has to get to the hospital for 9:05 am
   What is the latest time he can leave home?

10. Write down the time which is :-
    a  25 minutes after 10:35 am  
    b  20 minutes before 6:15 pm.
    c  30 minutes before 2:20 pm  
    d  40 minutes after 4:30 am.

11. What is :-
    a  the month just after August  
    b  the month just before December
    c  the 4th month of the year  
    d  the 11th month
    e  the 3rd month after May  
    f  the month just after December?

12. How many days are there in the month of :-
    a  March  
    b  June  
    c  September  
    d  October?

13. My grandma was born on the 23rd of September, 1918.
    That was 23:09:18.
    a  Write your date of birth using these two different ways.
    b  Write today’s date in these two ways.

14. Write out the following dates in full :-
    a  22:05:96  
    b  01:12:04.
Calculators should NOT be used anywhere in this chapter unless you are told to do so.

**Multiplication**

For this, you really must know your tables.

Revise or learn them NOW - tables must be learned !!

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<td>6 x 9 = 54</td>
<td>7 x 9 = 63</td>
<td>8 x 9 = 72</td>
<td>9 x 9 = 81</td>
</tr>
</tbody>
</table>

**Find 27 x 6**

Find 840 x 9

- Put the 6 beneath the 7
- Put the 9 beneath the 0

27 x 6 = 162

840 x 9 = 7560
Exercise 1

1. **Copy** and complete each calculation :-

   a. 32 \( \times 6 \)
   b. 51 \( \times 3 \)
   c. 63 \( \times 7 \)
   d. 52 \( \times 4 \)
   e. 45 \( \times 5 \)
   f. 99 \( \times 2 \)
   g. 48 \( \times 8 \)
   h. 63 \( \times 9 \)

2. **Copy** and find :-

   a. 230 \( \times 8 \)
   b. 160 \( \times 6 \)
   c. 530 \( \times 4 \)
   d. 890 \( \times 2 \)
   e. 370 \( \times 3 \)
   f. 650 \( \times 7 \)
   g. 240 \( \times 9 \)
   h. 720 \( \times 5 \)

3. Set these down in a similar way as shown above and find :-

   a. 63 \( \times 7 \)
   b. 74 \( \times 5 \)
   c. 86 \( \times 4 \)
   d. 15 \( \times 9 \)
   e. 290 \( \times 6 \)
   f. 130 \( \times 8 \)
   g. 620 \( \times 3 \)
   h. 780 \( \times 2 \)

4. a. What is the cost of 6 tyres if one tyre costs £38?
   b. A large bag of crisps weighs 45 grams.
      What will 8 bags weigh?
   c. A snake crawls 72 cm in one minute.
      At the same speed, how far will it travel in 5 minutes?
   d. A small bottle holds 240 millilitres.
      How many millilitres are there in 4 bottles?
   e. A space station orbits the moon every 32 hours.
      How long will it take to orbit the moon 9 times?
If you **DOUBLE** a number → you simply multiply it by 2.

→ double 7 → $2 \times 7 = 14$  double 36 → $2 \times 36 = 72$

If you **TREBLE** a number → you simply multiply it by 3.

→ treble 6 → $3 \times 6 = 18$  treble 19 → $3 \times 19 = 57$

5. What is :-
   a  double 9  
   b  double 16  
   c  double 25  
   d  double 47 ?

6. What is :-
   a  treble 7  
   b  treble 10  
   c  treble 20  
   d  treble 39 ?

In this “funfair” game, you throw hoops at a board to win prizes.

- A **green** hoop counts **SINGLE**
- A **blue** hoop counts **DOUBLE**
- A **red** hoop counts **TREBLE**

7. a  What was the score from the green hoop ?
    b  What was the score from the blue hoop ? (**not** 50 !)
    c  What was the score from the red hoop ?
    d  What was the **TOTAL** score?

8. For each game, write down the score gained by each hoop. Now the write down the **TOTAL** score.

```
   a     b     c

   HOOP-LA    HOOP-LA    HOOP-LA
   5      40    5      40    5      40
   30     50    30     50    30     50
   15     25    15     25    15     25
   10     35    10     35    10     35
```

---

**this is Chapter Five**  **page 52**  **WHOLE NUMBERS 2**
When playing darts, if a dart lands on:

- **double** 12 → you score $2 \times 12 = 24$
- **treble** 18 → you score $3 \times 18 = 54$
- **outer** → you score 25
- **bull’s eye** → you score 50

9. a Write down the value of each of the 3 darts.
   b What is the **TOTAL** score for all 3 darts?

10. What did each person score here?
Division by a Digit

Again, knowing your tables really helps here.

Find \( 78 \div 3 \)

\[ 3 \overline{2}\overline{6} \]

Find \( 324 \div 6 \)

\[ 6 \overline{5}\overline{4} \]

Exercise 2

1. Copy and complete :-

   a \[ 3 \overline{1}\overline{\ldots} \]
   b \[ 4\overline{9}\overline{2} \]
   c \[ 5\overline{7}\overline{5} \]
   d \[ 6\overline{8}\overline{4} \]
   e \[ 7\overline{9}\overline{1} \]
   f \[ 8\overline{9}\overline{6} \]
   g \[ 9\overline{9}\overline{9} \]
   h \[ 2\overline{9}\overline{4} \]

2. Copy and find :-

   a \[ 4\overline{1}\overline{3}\overline{2} \]
   b \[ 6\overline{2}\overline{7}\overline{0} \]
   c \[ 5\overline{7}\overline{1}\overline{0} \]
   d \[ 7\overline{2}\overline{4}\overline{5} \]
   e \[ 9\overline{3}\overline{7}\overline{8} \]
   f \[ 8\overline{5}\overline{0}\overline{4} \]
   g \[ 3\overline{6}\overline{2}\overline{1} \]
   h \[ 2\overline{5}\overline{3}\overline{2} \]
   i \[ 6\overline{8}\overline{0}\overline{4} \]
   j \[ 7\overline{4}\overline{3}\overline{4} \]
   k \[ 5\overline{4}\overline{9}\overline{5} \]
   l \[ 4\overline{3}\overline{8}\overline{8} \]

There are different ways of asking:- “divide 87 by 3”.

\[ 3 \overline{8}\overline{7} \]

87 \div 3

3 into 87

\[ \frac{87}{3} \]
3. Write each of the following in the form \(3 \sqrt{87}\) and do the calculation:

a. \(64 \div 4\)  
b. \(\frac{6}{150}\)  
c. \(\frac{95}{5}\)  
d. \(2 \text{ into } 624\)  
e. \(98 \text{ divided by } 7\)  
f. \(276 \div 4\)  
g. \(\frac{416}{8}\)  
h. \(\frac{9}{504}\)  
i. \(3 \text{ into } 543\)  
j. \(500 \text{ divided } 4\)  
k. \(\frac{756}{6}\)  
l. \(301 \div 7\)

4. Show your working in all of the following questions:

a. 4 apples cost 92p.  
   What is the cost of 1 apple?

b. 6 barrels of apples weigh 186 kg.  
   What will 1 barrel weigh?

c. To run 5 hundred metres takes Nick 85 seconds.  
   How long would it take him to run 1 hundred metres at the same pace?

d. I drank 3 cups of tea.  
   Altogether I drank 192 millilitres.  
   How many millilitres are there in 1 cup?

e. 8 packets of "Chewit" weigh 360 grams.  
   What will 1 packet weigh?

f. 7 verses of a song are played.  
   The total time taken is 378 seconds.  
   How long does each verse last?

g. When I treble my age, the answer comes to 129 years.  
   How old am I?

h. When Mr Todd worked during Easter Monday, he got “Double” his normal pay.  
   Mr Todd earned £152 on Easter Monday.  
   What is his normal “pay” for a day’s work?
5. A simple way of dividing a number by 6 is to
   \[ \text{divide by 2, then divide your answer by 3}. \]
   a. Find \(288 \div 6 = \ldots\)
   b. Now find \(288 \div 2 = \ldots\) and then find \(\ldots \div 3 = \ldots\).

   Did you get the same answer?

6. Copy and complete:
   a. “To divide by 8, I could divide by 2, then divide by ……”
   b. “To divide by 9, I could divide by 3, then divide by ……”
   c. “To divide by 10, I could divide by 2, then divide by ……”

7. Find these by following the instructions:
   a. Find \(656 \div 8\) by dividing by 2, then dividing your answer by 4.
   b. Find \(756 \div 9\) by dividing by 3, then dividing your answer by 3.
   c. Find \(470 \div 10\) by dividing by 2, then dividing your answer by 5.

**Multiplication by 10**

A very easy way to multiply a number by 10 is to
simply put a 0 onto the end of the number.

- Find \(61 \times 10\)
- Find \(80 \times 10\)
- Find \(112 \times 10 = 1120\)
Exercise 3

1. **Copy** and complete :-

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
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<td>31</td>
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<td>530</td>
<td>400</td>
<td>605</td>
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<td>x 10</td>
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<td>x 10</td>
<td>x 10</td>
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</tbody>
</table>

2. Do the following **mentally** (just write down your answer) :-

   a  42 x 10   b  77 x 10   c  10 x 18   d  95 x 10
   e  10 x 213   f  185 x 10   g  320 x 10   h  10 x 803

3. a  A blank recordable C.D. costs 47p.  
    What will a box of **10** C.D.'s cost ?

   b  1 jar of jam weighs 375 grams.  
    What will a carton of **10** jars weigh ?

   c  A farmer plants **10** trees in a row.  
    How many trees are there in **52** rows ?

   d  A carton of juice holds 520 millilitres.  
    How many millilitres are in **10** cartons ?

4. There are **10** millimetres in **1** centimetre.
   How many millimetres are there in :-

   a  6 cm   b  18 cm   c  75 cm   d  120 cm   e  743 cm ?
Division by 10

If a number ends in a "0", a way of dividing it by 10 is to :-) 

simply remove the 0 at the end of the number.

Find 560 ÷ 10
Find 2010 ÷ 10
Find 1800 ÷ 10

1800 ÷ 10 = 180

Exercise 4

1. Copy and complete :-
   a  10 270  b  10 940  c  10 1620  d  10 800
   e  10 300  f  10 5080  g  10 7200  h  10 6060
   i  10 5000  j  10 8000  k  10 1000  l  10 1010

2. Do the following mentally (just write down the answer) :-
   a  640 ÷ 10  b  720 ÷ 10  c  1900 ÷ 10  d  10 4200
   e  10 6080  f  5600 ÷ 10  g  10 1760  h  1000 ÷ 10

3. There are various ways of writing “divide by 10”.

   390 ÷ 10  "10 into 390"  \( \frac{1}{10} \) of 390

   Find :-
   a  580 ÷ 10  b  \( \frac{1}{10} \) of 710  c  \( \frac{950}{10} \)
   d  10 760
   e  10 into 900  f  4080 \( \frac{10}{10} \)  g  \( \frac{1}{10} \) of 6000  h  9050 ÷ 10
4. There are 10 millimetres in 1 centimetre.
   How many centimetres are there in:
   a 40 mm  
   b 90 mm  
   c 160 mm  
   d 400 mm  
   e 720 mm?

5. a 180 tennis balls are packed into boxes of 10.
   How many boxes are needed?
   b 640 trees are planted in an orchard.
   If there are 10 trees in each row, how many rows are there?
   c At a party, 300 sweets were shared equally amongst 10 people.
   How many sweets did each person get?
   d Bob and his nine pals share 7000 millilitres of juice equally.
   How many millilitres will each person receive?
   e A fence has 320 planks of wood.
   A tenth of the planks is to be painted brown.
   How many planks will be painted brown?

6. Nick's uncle Bill left ten thousand pounds in his will.
   Nick got a tenth of this amount.
   How much did Nick receive?

7. A tank holds 400 gallons of water.
   A barrel holds a tenth of a tank.
   A bucket holds a tenth of a barrel.
   How many gallons does a bucket hold?

   He put an equal amount of marbles into 10 boxes.
   a How many marbles are in each box?
   Ben then took the marbles from one box and put an equal amount into 10 bags.
   b How many marbles would be in each bag?
   c How many bags will Ben need for his whole collection?
Look at this number line.
The arrow points to the number 27
• Can you see that 27 lies between 20 and 30?
• Can you see that 27 is closer to 30 than 20?

We say that, “27, rounded to the nearest 10, is 30”

Rule:– If the last digit is a 1, 2, 3, 4 round DOWN
If the last digit is a 5, 6, 7, 8, 9 round UP

Exercise 5

1. Look at this number line.
   Copy the following and complete:
   • 43 lies between 40 and ....
   • 43 is closer to .... than ....
   • 43 rounds to .... (to the nearest 10)

2. Copy and complete:
   • 168 lies between 160 and ....
   • 168 is closer to .... than ....
   • 168 rounds to .... (to the nearest 10)

3. Picture in your head, the number 62.
   Copy and complete:
   • 62 lies between 60 and ....
   • 62 is closer to .... than ....
   • 62 rounds to .... (to the nearest 10)
4. By imagining the following numbers, decide what each one rounds to, (to the nearest 10) :-
   a  Lucy finds that 86 lies between 80 and ..... It is closer to .....  
   b  Alex finds that 122 lies between ..... and 130 It is closer to .....  
   c  Alan finds that 257 lies between 250 and ..... It is closer to .....  
   d  Jane finds that 607 lies between 600 and ..... It is closer to .....  

A short way of writing “72 rounds to 70 to the nearest 10” 
is to simply write 72 —> 70

5. Copy each of the following and round to the nearest 10 :-
   a  46 —> 50 b  82 —> ...... c  19 —> ...... d  84 —> ......  
   e  146 —> ...... f  181 —> ...... g  219 —> ...... h  424 —> ......  
   i  65 —> ...... j  195 —> ...... k  203 —> ...... l  888 —> ......

6. a  There were 137 pupils at the school dance.  
    Round this to the nearest 10.  
    b  It is 432 miles from my home by car to London.  
    Round this to the nearest 10 miles.  
    c  My bed is 196 cm long.  
    Round this to the nearest 10 cm.  
    d  When Lucy’s dad stood on the scales, he weighed 154 pounds.  
    What is his weight to the nearest 10 pounds ?  
    e  When a “Lottery” win was shared, each person received 476 dollars.  
    Round this to the nearest 10 dollars.
We can round numbers to the nearest 10 to estimate calculations.

Example 1

\[
\begin{align*}
137 + 59 &= 200 \text{ (approx)} \\
140 + 60 &= 200 \text{ (approx)}
\end{align*}
\]

Example 2

\[
\begin{align*}
273 - 127 &= 140 \text{ (approx)} \\
270 - 130 &= 140 \text{ (approx)}
\end{align*}
\]

Exercise 6

1. Copy and complete each calculation :-

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<td>58 + 77</td>
<td>94 + 86</td>
<td>36 + 68</td>
<td>137 + 264</td>
<td>131 - 88</td>
<td>197 - 133</td>
<td>262 - 188</td>
<td>493 - 416</td>
<td>674 + 188</td>
<td>503 - 438</td>
<td>819 + 263</td>
<td>996 - 599</td>
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<td>is about</td>
<td>60 + 80</td>
<td>90 + \ldots</td>
<td>\ldots + 70</td>
<td>\ldots + \ldots</td>
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2. Estimate (mentally):

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<tbody>
<tr>
<td></td>
<td>49 + 33</td>
<td>67 + 89</td>
<td>63 + 29</td>
<td>121 + 101</td>
<td>83 - 59</td>
<td>154 - 27</td>
<td>262 - 98</td>
<td>673 - 469</td>
<td>\ldots + \ldots</td>
<td>\ldots - \ldots</td>
<td>\ldots + \ldots</td>
<td>\ldots - \ldots</td>
</tr>
</tbody>
</table>

3. Gary had 751 stamps in his collection.
He sold 199 stamps.

Estimate how many stamps he still had.
Using a Calculator (You may use a calculator)

In this exercise, you must decide, in each problem, whether to add, subtract, multiply or divide. You must choose the correct one.

Example 1
Ted weighs 196 pounds.
Jack weighs 187 pounds.
How much do they weigh together?
→ You must add (196 + 187)
=> 196 + 187 = 383 pounds

Example 2
One copy of a C.D. costs £17.
What is the total cost of 12 C.D.’s
→ You must multiply (12 x £17)
=> 12 x £17 = £204

Exercise 7
In every question, YOU must decide to +, -, x, or ÷.
Write down and show what calculation you are doing.

1. Brian and Sue went shopping with £150.
   They spent £117 in one shop.
   How much money had they left?

2. Julie booked a school trip for herself and 26 pupils.
   Each person was charged £185.
   What was the total cost for all of them?

3. There were 23 men, 37 women, 116 boys and 138 girls on a Sunday School trip.
   How many were on the trip altogether?
4. Alice, Nicola, Julie and Lynne won £976 each on the Lottery.
   How much was this altogether?

5. A truck weighs 750 kg when empty. 8 cartons are loaded onto the truck. Each carton weighs 175 kg.
   Calculate the total weight.

6. A fence was 525 cm long.
   During a winter storm, a section 187 cm long, was blown down.
   What length remained standing?

7. A scientist measured 512 millilitres of liquid equally into 16 small jars.
   How many millilitres are in each jar?

8. Nick walks from his home to school. He then walks from school to a shop. He then walks home the other way.
   How far has he walked altogether?

9. Lucy bakes trays of chocolate chip cookies for her School Fayre.
   Each tray contains 12 cookies.
   How many trays are needed if she bakes 720 cookies?

10. Ben was flying his model plane at a height of 338 metres.
    He lost control and the plane dropped to a height of 97 metres.
    By how many metres had the plane dropped?
11. When a Lottery win was shared equally among a group of 23 winners, each person received £475. What must the total winnings have been?

12. A grocer was counting the money in his cash register. He had seventeen £50 notes, thirty five £20 notes, eighty seven £10 notes and forty five £5 notes. How much cash had he altogether?

13. There are 365 days in a year. Harry is exactly 12 years old. For how many days has Harry lived (forget Leap Years)?

14. A cardboard box contains 12 fruit loaves. The total weight is 4000 grams. The empty box weighs 880 grams.
   a. What is the weight of all 12 fruit loaves?
   b. What is the weight of 1 loaf?

15. Jemma practises her times tables for 12 minutes every day.
   a. How many minutes does she practise every week?
   b. How many minutes does she practise in November?
   c. How many minutes does she practice in a year? (365 days)

16. A small carton of soda holds 150 millilitres. Cartons are put in packs of eight. A box holds nine packs. How many millilitres does a box hold?

17. How many minutes are there in:–
   a. January  
   b. April  
   c. June, July and August altogether?
Topic in a Nutshell

1. Set down these multiplications and try them:

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<tr>
<td>72 x 6</td>
<td>87 x 4</td>
<td>64 x 3</td>
<td>270 x 5</td>
</tr>
</tbody>
</table>

2. What is the cost of 6 dining room chairs priced at £39 each?

3. What is:
   a) double 7  
   b) double 36  
   c) treble 30  
   d) treble 28

4. At the funfair we visited earlier:
   a) green hoop counted as single;  
   b) blue hoop counted double;  
   c) red hoop counted treble.
   a) Write the score gained by each hoop.  
   b) Add them up to find the total score.

5. Copy these divisions and find the answers:

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<td>927</td>
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<td>i</td>
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</tr>
<tr>
<td>96 ÷ 6</td>
<td>9 into 819</td>
<td>405 ÷ 5</td>
<td>104 divided by 8</td>
</tr>
</tbody>
</table>
6. 7 bananas cost 98 pence.
    Find the cost of one banana.

7. A set of 8 tyres for a lorry cost £512 in total.
    Work out the cost of one tyre.

8. Find the answer to :-
   a 424 ÷ 8 by dividing by 2, then dividing your answer by 4.
   b 648 ÷ 9 by dividing by 3, then dividing your answer by 3.

9. Do the following – just write down the answer :-
   a 21 × 10  b 354 × 10  c 500 × 10  d 999 × 10
   e 320 ÷ 10  f 1700 ÷ 10  g 7840 ÷ 10  h 9000 ÷ 10

10. Envelopes can be bought in a box containing 520 envelopes.
    An office buys 10 boxes. How many envelopes will it have?

11. There are 10 millimetres in 1 centimetre.
    How many millimetres are there in :-
    a 3 cm  b 47 cm  c 800 cm  d 584 cm ?

12. A grocer has 150 eggs which he places into boxes, each containing 10 eggs.
    How many boxes will he fill?

13. A chest contains 300 melons.
    A display box can take a tenth of a chest.
    A supermarket bag can hold a tenth of a display box.
    How many melons can a supermarket bag hold?

14. Round these numbers to the nearest 10 :-
    a 14  b 69  c 563  d 855.

15. Round each number to the nearest ten, then do the calculation :-
    a 67 + 31  b 59 – 38  c 829 + 111  d 998 – 399.
16. Jane and Bill bought a DVD/Video player for £137. They paid for it with two £100 gift vouchers. How much change did they get?

17. The coach driver went in with 18 senior citizens to the cinema. The total cost of £57 for the outing was split equally amongst everyone. What did it cost the coach driver?

18. Dana bought:
   - 5 hamburgers at 99p each
   - 6 cokes at 48p each
   - 8 slices of pizza at 65p each.
   How much did all this cost her altogether?

19. A fridge can hold 6300 millilitres of orange juice. The fridge will hold seven packs of juice. There are six cartons in each pack. How many millilitres does each carton of orange juice contain?

20. A small bottle holds 125 millilitres of soda. A box holds 12 bottles. A case holds 6 boxes. A crate holds 10 cases. How many millilitres of soda are in a full crate?
Calculators should NOT be used in this chapter unless told to do so.

**Tally Marks & Tables**

**Tally Table**

Putting a long list of numbers into a table or graph can make it easier to understand the information in the list.

**Example**

Pupils were asked where they liked to go on holiday.

The table shows their answers.

Put the information into a tally table.

<table>
<thead>
<tr>
<th>Place</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Italy</td>
<td>1111</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>111</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>U.K.</td>
<td>11</td>
<td>6</td>
</tr>
</tbody>
</table>

2 pupils chose USA.
4 pupils chose Italy.
5 pupils chose France.

The tally marks are in groups of five. (Easier to count a lot of tally marks).

**Exercise 1**

1. Look at the tally table above.
   a. How many pupils chose Spain?
   b. How many pupils chose U.K.?
   c. How many more pupils chose Spain than U.S.A.?
   d. How many pupils were asked altogether?
2. Use tally marks to represent each number:

Remember to group in five. \( (\text{HHH\ l}) \text{ represents } 6. \)

\[ \begin{array}{cccc}
\text{a} & 7 & \text{b} & 5 \\
\text{c} & 4 & \text{d} & 8 \\
\text{e} & 9 & \text{f} & 10 \\
\text{g} & 12 & \text{h} & 17.
\end{array} \]

3. Pupils were asked to name their favourite drink.

<table>
<thead>
<tr>
<th>Drink</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cola</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Orange</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Water</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Lemon</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Irn Bru</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Lemon</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
<tr>
<td>Water</td>
<td>(\text{HHH\ l} )</td>
<td>6</td>
</tr>
</tbody>
</table>

\[\begin{array}{ccc}
\text{Cola} & \text{Irn Bru} & \text{Cola} \\
\text{Orange} & \text{Irn Bru} & \text{Orange} \\
\text{Water} & \text{Cola} & \text{Orange} \\
\text{Lemon} & \text{Orange} & \text{Water} \\
\text{Irn Bru} & \text{Irn Bru} & \text{Lemon} \\
\text{Irn Bru} & \text{Irn Bru} & \text{Irn Bru} \\
\text{Water} & \text{Irn Bru} & \text{Lemon} \\
\text{Irn Bru} & \text{Irn Bru} & \text{Irn Bru}
\end{array}\]

\[\begin{array}{ccc}
a \text{ Copy and complete the tally table.} \\
b \text{How many pupils chose Orange?} \\
c \text{What was the most popular drink?} \\
d \text{How many more pupils chose Irn Bru than Cola?} \\
e \text{How many pupils were asked to name their favourite drink?}
\end{array}\]

4. Each year, teachers voted for the best behaved primary class.

\[\begin{array}{cccccccc}
P1 & P4 & P7 & P5 & P2 & P4 & P4 & P5 \\
P5 & P6 & P2 & P6 & P5 & P7 & P5 & P5 \\
P5 & P5 & P7 & P2 & P4 & P4 & P5 & P5
\end{array}\]

\[\begin{array}{ccc}
a \text{Copy and complete the Tally table.} \\
b \text{How many teachers voted for:—} \\
i \text{P2} \quad \text{ii} \text{P3} \quad \text{iii} \text{P4?} \\
c \text{Which primary class was voted the best behaved?} \\
d \text{How many teachers voted?}
\end{array}\]

\[\begin{array}{ccc}
\text{Class} & \text{Tally} & \text{Number} \\
P1 & P2
\end{array}\]

\[\begin{array}{ccc}
\text{Make a copy of this table}
\end{array}\]
5. Pupils were asked to name their favourite season.

<table>
<thead>
<tr>
<th>Season</th>
<th>Winter</th>
<th>Summer</th>
<th>Spring</th>
<th>Summer</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>Summer</td>
<td>Spring</td>
<td>Summer</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>Winter</td>
<td>Summer</td>
<td>Spring</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td>Summer</td>
<td>Winter</td>
<td>Spring</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>Autumn</td>
<td>Summer</td>
<td>Winter</td>
<td>Summer</td>
<td>Summer</td>
<td></td>
</tr>
</tbody>
</table>

a Make a Tally table to show this information.
b How many more pupils chose Spring than Autumn?
c What was the most popular season?

6. Shown are the number of pupils in each class in a school.

<table>
<thead>
<tr>
<th>Pupils</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Copy and complete the tally table.
b How many classes are in the school?
c Use a calculator to find how many pupils are at the school.

7. Thirty six packets of sweets are opened.

The number of sweets in each packet is shown in the table.

<table>
<thead>
<tr>
<th>Number</th>
<th>8</th>
<th>10</th>
<th>7</th>
<th>12</th>
<th>11</th>
<th>9</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Make a Tally table to show this information.

8. Do a survey with twenty of your friends or family.

Decide what you want your survey to be about first (you decide!)

Make a tally table to show your information.
A graph can be made using pictures (a pictograph).
The graph must have a key which explains what each picture stands for.

Example

The pictograph below shows the number of primary 3 pupils who attended a lunchtime computer club.

The key shows that each man represents 2 pupils.  

<table>
<thead>
<tr>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: stands for 2 pupils.

On Monday 6 pupils attended.  
(Can you see that the answer is NOT 3?)

On Tuesday 9 pupils attended.  
(Can you see why the answer IS 9?)

Exercise 2

1. Look at the pictograph above.
   a How many pupils attended on  
      i Wednesday ii Thursday iii Friday? 
   b How many pupils attended altogether?

2. This pictograph shows the number of people waiting at a bus stop.
   
   Key: stands for 2 people.

Write down the number of people waiting at: -
   a 1 pm   b 2 pm   c 3 pm   d 4 pm   e 5 pm.
3. This pictograph shows the number of goals scored by a team each month.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept</td>
<td>XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct</td>
<td>XX</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: \(\) stands for 4 goals.

a) Write down how many goals were scored each month.
b) What was the team's worst month?
c) How many goals did the team score altogether from August to December?

4. The number of competitors in each event at the sports day is shown.

a) Look at the key. How many people does \(\) stand for?

b) Write down how many competitors took part in each event.
c) How many people took part in a jumping competition?
d) How many competitors took part altogether?

5. This table shows the numbers of competitors last year.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High Jump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Jump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make a pictograph to show this information. (Use the same key as that used in question 4).
Bar Graphs

Bar graphs are like Pictographs but they use bars instead of pictures. You must read the numbers on the lines to find the total of each bar.

Example

This bar graph shows the number of pets owned by Primary 5.

Can you see that:
- 10 mice are owned by Primary 5?
- 6 snakes are owned by Primary 5?

Exercise 3

1. Look at the bar graph above.
   a. How many cats are owned by primary 5?
   b. How many fish are owned by primary 5?
   c. How many dogs are owned by primary 5?
   d. How many pets are owned by primary 5 altogether?

2. This bar graph shows the number of pets owned by Primary 7.
   a. Write down the number of each type of pet owned.
   b. How many pets are owned by primary 7 altogether?
3. This bar graph shows the number of drink bottles sold at the school tuck shop.

   a How many bottles of lemon were sold?
      (Answer is NOT 4)

   b Write down how many bottles of each type of drink were sold.

   c How many more bottles of Irn Bru were sold than Orange?

   d How many bottles were sold altogether?

   ![Bar Graph]

   Most bar graphs have bars that go up (vertical).

4. Packets of crisps were sold at the tuck shop one day.

   The bar graph shows what type were sold.

   Can you see that 6 packets of salt crisps were sold?

   a Write down the number of:

      i Cheese sold
      ii Beef sold
      iii Chicken sold
      iv Onion sold.

   b How many more packets of Cheese were sold than Beef?

   c How many packets of crisps were sold in total?

   ![Bar Graph]

5. The bar graph shows the number of pupils taking part in sports day competitions.

   a Write down the number of pupils who took part in each type of sport.

   b How many pupils in total took part in the sports day?

   ![Bar Graph]
6. Pupils were asked their favourite colour.
   The bar graph shows the results.
   a Write down how many pupils chose each colour.
   b How many pupils were asked in total?

7. Pupils were asked to name their favourite T.V. sport.
   The results are listed in the table shown.

<table>
<thead>
<tr>
<th>Sport</th>
<th>No. of Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennis</td>
<td>8</td>
</tr>
<tr>
<td>Football</td>
<td>14</td>
</tr>
<tr>
<td>Golf</td>
<td>10</td>
</tr>
<tr>
<td>Snooker</td>
<td>2</td>
</tr>
<tr>
<td>Darts</td>
<td>4</td>
</tr>
</tbody>
</table>

   Copy and complete the bar graph using the table above.

8. Pupils were asked to name their favourite schoolday.
   The results are shown in the table.

<table>
<thead>
<tr>
<th>Day</th>
<th>No. of Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>10</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2</td>
</tr>
<tr>
<td>Wednesday</td>
<td>6</td>
</tr>
<tr>
<td>Thursday</td>
<td>11</td>
</tr>
<tr>
<td>Friday</td>
<td>13</td>
</tr>
</tbody>
</table>

   Make a bar graph to show this information.
   (Remember to have a title and headings).

9. The table shows a survey asking people to name their favourite ice-cream.

<table>
<thead>
<tr>
<th>Ice Cream</th>
<th>No. of Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanilla</td>
<td>16</td>
</tr>
<tr>
<td>Choco</td>
<td>20</td>
</tr>
<tr>
<td>Toffee</td>
<td>4</td>
</tr>
<tr>
<td>Berry</td>
<td>28</td>
</tr>
<tr>
<td>Mint</td>
<td>12</td>
</tr>
<tr>
<td>Coffee</td>
<td>10</td>
</tr>
</tbody>
</table>

   Make a bar graph to show this information.

10. Carry out a survey of your own. Make a bar graph to show your results.
Exercise 4

1. The table shows the number of miles Terry cycled each day.
   a How many miles did Terry cycle on Monday?
   b How many miles did Terry cycle on:
      i Tuesday
      ii Wednesday
      iii Thursday
   c How many miles did Terry cycle altogether?

<table>
<thead>
<tr>
<th>DAY</th>
<th>miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>7</td>
</tr>
<tr>
<td>Tuesday</td>
<td>6</td>
</tr>
<tr>
<td>Wednesday</td>
<td>4</td>
</tr>
<tr>
<td>Thursday</td>
<td>10</td>
</tr>
<tr>
<td>Friday</td>
<td>3</td>
</tr>
</tbody>
</table>

2. Mr and Mrs Todd had a meal in the “Feast of Delights” restaurant.
   The table shows what both of them ate.
   a What did Mrs Todd have for starter?
   b What did Mr Todd have for his main course?
   c Write down what each person had for their sweet.

<table>
<thead>
<tr>
<th></th>
<th>Starter</th>
<th>Main</th>
<th>Sweet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr T</td>
<td>Prawns</td>
<td>Steak</td>
<td>Ice-cream</td>
</tr>
<tr>
<td>Mrs T</td>
<td>Soup</td>
<td>Fish</td>
<td>Cake</td>
</tr>
</tbody>
</table>

3. Terry, the paper boy, delivers two different newspapers over a weekend.
   The table shows the number of newspapers he delivered.
   a How many Times newspapers did Terry deliver on:
      i Friday    ii Saturday   iii Sunday?
   b How many Daily newspapers did he deliver each day?
   c How many newspapers did Terry deliver on Friday?
   d How many newspapers did Terry deliver altogether:
      i on Saturday  ii on Sunday  iii over the 3 days?

<table>
<thead>
<tr>
<th></th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times</td>
<td>15</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Daily</td>
<td>18</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>
4. The school **SPORTS DAY** has a timetable as shown.
   
   a. What time does the **Javelin** competition start?
   
   b. Where does the **Gymnastics** competition take place?
   
   c. Ben is at the **Track** at 2.30pm. What is he watching?
   
   d. At what time and where will the **100 m race** take place?

5. The local cinema times are shown in the advert.
   
   Can you see that Studio 2 at 9 pm is showing Batgirl?
   
   a. Write what film is showing in:
      
      i. Studio 1 at 5 pm
      ii. Studio 3 at 7 pm
      iii. Studio 2 at 5 pm.
   
   b. List where and at what times I could see **Supermum**.

6. The table shows the prices of holidays.
   
   a. How much would it cost to go to:
      
      i. **Majorca** for 2 weeks
      ii. **Zante** for 3 weeks
      iii. **Tenerife** for 4 weeks
   
   b. Sally spent £290 on her holiday. Where did Sally go and for how long?
   
   c. Jack and Jill went to **Majorca** for 1 week. What was the total cost?
1. A group of children were asked -
“What would you like to be when you grow up?”

<table>
<thead>
<tr>
<th>Job</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus Driver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a  Copy and complete the tally table.
b  How many children chose Bus Driver ?
c  What was the least popular job ?
d  How many more children chose teacher than model ?

2. The pictograph shows the result of the survey -
“What kind of food do you like?”

<table>
<thead>
<tr>
<th>Food</th>
<th>Chinese</th>
<th>Indian</th>
<th>Italian</th>
<th>French</th>
<th>British</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a  What kind of food was most popular ?
b  Write down the number of people who liked the food of :
   i  China  ii  India  iii  Italy  iv  France  v  Britain.
c  How many fewer people preferred Italian to French food ?
d  How many people took part in the survey ?

3. This table shows the fruit preferred by a primary 5 class.

<table>
<thead>
<tr>
<th>Fruit</th>
<th>8</th>
<th>6</th>
<th>10</th>
<th>1</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make a pictograph to show this information using you own key.
4. Children at a leisure centre were asked to name their favourite drink. The results are shown in the bar graph below.

a) How many children chose:
   i) cola
   ii) lime
   iii) lemon?

b) How many more children preferred orange to pear?

c) How many children were asked in this survey?

5. The table shows a survey asking people to name their favourite sportswear label.

<table>
<thead>
<tr>
<th>Nocku</th>
<th>Nocku</th>
<th>Kappi</th>
<th>Speedo</th>
<th>Adiddo</th>
<th>Kappi</th>
<th>Kappi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speedo</td>
<td>Nocku</td>
<td>Adiddo</td>
<td>Ombra</td>
<td>Nocku</td>
<td>Nocku</td>
<td>Nocku</td>
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<tr>
<td>Adiddo</td>
<td>Kappi</td>
<td>Adiddo</td>
<td>Speedo</td>
<td>Ombra</td>
<td>Nocku</td>
<td>Nocku</td>
</tr>
<tr>
<td>Kappi</td>
<td>Adiddo</td>
<td>Kappi</td>
<td>Ombra</td>
<td>Nocku</td>
<td>Nocku</td>
<td>Kappi</td>
</tr>
</tbody>
</table>

Draw a bar graph to show this information. (Tally marks might help).

(Use the same scale as in Q4 - remember to label your diagram and give it a name.)

6. Cinema ticket prices are shown in the table.

a) How much would it cost for:
   i) one adult stalls ticket on Monday?
   ii) one child circle ticket on Saturday?
   iii) Two adult upper circle tickets on Friday?

b) Mr Percy and his daughter went to the cinema. It cost him £15.

Name which days he could have gone and where they sat in the cinema.
Chapter 7

**Number Machines**

A number machine (or function machine) is the name for a mathematical rule which changes one number into another.

**Example:** The number machine below takes a number IN one side doubles it and pushes the answer OUT the other side.

Jane put IN the number 6 :-

12 comes OUT

**Exercise 1**

1. What number will come OUT of each number machine :-

   a. ![Diagram](image)

   b. ![Diagram](image)

2. These number machines add 3 to any number put IN.

   What number will come OUT in each of these machines :-

   a. ![Diagram](image)

   b. ![Diagram](image)
3. What number will come OUT of each number machine:–

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>5</td>
<td>+</td>
<td>6</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>10</td>
<td>−</td>
<td>2</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>8</td>
<td>×</td>
<td>3</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>8</td>
<td>÷</td>
<td>2</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>11</td>
<td>+</td>
<td>10</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>20</td>
<td>−</td>
<td>13</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>7</td>
<td>×</td>
<td>5</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>50</td>
<td>÷</td>
<td>10</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>14</td>
<td>+</td>
<td>23</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>j</td>
<td>73</td>
<td>−</td>
<td>16</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

4. Look at this number machine.
What number comes OUT when you put IN the number:–

<table>
<thead>
<tr>
<th>IN</th>
<th>OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>5</td>
</tr>
</tbody>
</table>

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1</td>
<td>b</td>
<td>12</td>
<td>c</td>
<td>50</td>
</tr>
<tr>
<td>d</td>
<td>115</td>
<td>e</td>
<td>995</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Lucy makes up this number machine.
(Read the question carefully).
What number does Lucy put IN to get the following numbers OUT:–

<table>
<thead>
<tr>
<th>IN</th>
<th>OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>2</td>
</tr>
</tbody>
</table>

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>6</td>
<td>b</td>
<td>7</td>
<td>c</td>
<td>12</td>
</tr>
<tr>
<td>d</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Look at the two number machines below.

**Machine A**

```
IN + 8 OUT
```

**Machine B**

```
IN x 3 OUT
```

a  What number comes out when 7 is put into machine B?
b  What comes OUT when these numbers are put IN:
   i  5 into machine A
   ii 9 into machine B
   iii 0 into machine B
   iv 54 into machine A?
c  What number is put IN when these numbers come OUT:
   i 20 out of machine A
   ii 12 out of machine B
   iii 45 out of machine B
   iv 107 out of machine A?

7. A number in this number machine is missing.

What is the missing number?

8. Write down the missing number in each machine below:

a  

```
4 x... 28
```

b  

```
3 x... 27
```

c  

```
18 +... 6
```

d  

```
15 +... 20
```

e  

```
8 -... 7
```

f  

```
24 -... 22
```

g  

```
5 -... 17
```

h  

```
24 -... 7
```
9. Look at the cost of these sweets.

<table>
<thead>
<tr>
<th>No. of sweets</th>
<th>Cost (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9p</td>
</tr>
<tr>
<td>2</td>
<td>18p</td>
</tr>
<tr>
<td>3</td>
<td>27p</td>
</tr>
<tr>
<td>4</td>
<td>...p</td>
</tr>
<tr>
<td>5</td>
<td>...p</td>
</tr>
<tr>
<td>6</td>
<td>...p</td>
</tr>
</tbody>
</table>

a Copy and complete the table.
b Copy and complete the number machine for the number of sweets and the cost.
c Use the number machine to find the cost of 12 sweets.

10. Each pupil in a class is given 4 pencils.

a Copy and complete the table below:-

<table>
<thead>
<tr>
<th>No. of pupils</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of pencils</td>
<td>4</td>
<td>8</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

b Copy and complete the number machine to show how many pencils are needed if you know the number of pupils.
c Use your number machine to find the number of pencils needed for a class of 30 pupils.

11. The cost of a cake is £2.50.

a Make a number machine similar to that in question 10 to show the cost of any number of cakes.
b Use your number machine to find the cost of:–
   i 4 cakes   ii 10 cakes.
Combined Number Machines

Combined number machines have two or more parts.

Example:

Jane put the number 5 IN this machine. She got 13 OUT.
She put the number 7 IN. She got 17 OUT.

Exercise 2

1. Look at the number machine above.
   What number comes OUT if Jane put IN:-
   a  6  b  10  c  1  d 12  e  0 ?
2. Look at this combined number machine.
   What number comes OUT when we put IN:-
   a  2  b  5  c  7  d 20  e  0 ?
3. Write down the number that comes OUT of each machine :-
   a
   \[ 7 \xrightarrow{+ 5} \xrightarrow{x 2} \text{OUT} \]
   b
   \[ 15 \xrightarrow{\div 3} \xrightarrow{+ 4} \text{OUT} \]
4. Shown are two combined number machines.

Machine A ......  
```
IN -> x 3 -> + 1 -> OUT
```

Machine B ......  
```
IN -> x 2 -> + 5 -> OUT
```

a What number comes out when 7 is put into machine A?
b What comes OUT when these numbers are put IN:
   i 5 into machine A          ii 6 into machine B
   iii 0 into machine B        iv 10 into machine A?
c What number is put IN when these numbers come OUT:
   i 31 out of machine A        ii 15 out of machine B

d A number is put into both machines. The same answer comes out.
   What number must have been put IN? (* very difficult)
Algebra and Number Machines

Exercise 3

1. Use the number machine above.
   What comes OUT when Jane puts IN the letter :-
   a  y  b  p  c  h  d  t?

2. Look at this number machine.
   What comes OUT if Jane puts in :-
   a  x  b  y  c  k?

3. Write down what comes OUT in each number machine below :-
   a
   \[ a \rightarrow x \times 6 \rightarrow \text{OUT} \]
   b
   \[ x \rightarrow x \times 2 \rightarrow \text{OUT} \]
   c
   \[ y \rightarrow x \times 8 \rightarrow \text{OUT} \]
   d
   \[ k \rightarrow x \times 15 \rightarrow \text{OUT} \]
   e
   \[ x \rightarrow + 3 \rightarrow \text{OUT} \]
   f
   \[ y \rightarrow - 5 \rightarrow \text{OUT} \]
1. Write down the number that comes **OUT** of each number machine :-
   a
   ![Diagram 1](image1.png)
   b
   ![Diagram 2](image2.png)

2. Look at this number machine.
   a What number comes **OUT** when you put **IN** the number :-
     i 12
     ii 50
     iii 8
     iv 107 ?
   b What number is put **IN** if the number **OUT** is :-
     i 10
     ii 20
     iii 8
     iv 78 ?

3. One pizza costs £3.
   a Write down a **number machine** to show how to find the cost if you know the number of pizza’s.
   b Use your number machine to find the cost of eight pizza’s.

4. Write down the number that comes **OUT** of each number machine :-
   a
   ![Diagram 3](image3.png)
   b
   ![Diagram 4](image4.png)

5. A number is put **IN** both number machines in question 4. The same answer comes **OUT** both times.
   What number must have been put in both machines ?
Shapes which are drawn on paper or on a blackboard or interactive whiteboard are called **FLAT** shapes or **2-DIMENSIONAL** shapes.

**Examples:**
- triangle
- rectangle
- circle
- pentagon
- kite

**Exercise 1**

1. Look at the figures drawn below:

   - A
   - B
   - C
   - D
   - E
   - F
   - G
   - H
   - I
   - J
   - K
   - L
   - M

   a. Which of them are 2-dimensional shapes?
   b. Make a neat sketch of each 2-dimensional shape – write its name beside it.
   c. There are FIVE 3-dimensional shapes (solid shapes). Can you name them?
   d. Shape F is a 1-dimensional shape. Which other shape is 1 dimensional?
2. Look at this shape.
   a Name this type of shape.
   b How many **edges** does it have?
   c How many **corners** does it have?

3. Write down how many **edges** and **corners** each shape below has:
   a 
   b 
   c 
   d 

4. This 3 dimensional shape is called a **CUBOID**.
   a How many **faces** has it?
   b What shape is the blue face?
   c What shape is the red face?

5. This shape is called a **square based Pyramid**.
   a What shape is the bottom face?
   b What shape is the red face?

6. a Name this shape.
   b What shape is the green face?
   c What shape is the pink face?

7. Look at these shapes found in everyday life.
   Write down the **2 dimensional shapes** (squares, circles, triangles, ........) that you think are in each shape.
8. Shown below are small rough sketches of 2-dimensional shapes. Use a ruler to make accurate full sized drawings of each shape.

---

Tiling

Look at this simple shape. Square

Can you see that if you have lots of these squares, you could fit them together and cover your jotter with them?

A shape which can cover a page (with no gaps) is said to “Tile the Page” (cover it).

Exercise 2 (You will need $\frac{1}{2}$ cm squared paper for this exercise)

1. a In your jotter, draw the square and colour it in.
   b Now, surround your square with 8 more of these squares to show how it “tiles” the page.
   c Colour these squares using different colours.
2. **a** In your jotter, draw this **rectangle** and colour it in.

**b** Surround your rectangle with other identical rectangles to show how it “tiles” the page.

**c** Colour these rectangles using different colours.

---

3. **a** This time, draw a triangle **2 boxes** wide and **4 boxes** high and colour it.

**b** Show how to “tile” the paper by surrounding it with identical triangles. *(Some will have to be upside down).*

**c** Colour these in and create a nice pattern.

---

4. **a** Copy this diamond shape onto squared paper and colour it in. *(Do you know the mathematical name for this shape? hint :- it starts with rh.........)*

**b** Show how to tile the paper with this shape and colour your pattern.

---

5. This **L-shape** is harder to tile.

**a** Make a neat copy of this L-shape and colour it in.

**b** Show how the shape can “tile” the paper completely surrounding it with identical tiles.

---

6. **a** Draw this **T-shaped** tile and show how to tile the page by completely surrounding it with similar tiles.

---

this is Chapter Eight  page 92  2-DIMENSIONS
7. a Draw this “kite” shaped tile.
   b Show that it will tile by surrounding it completely using identical tiles.

   6 boxes
   4 boxes

8. Hard !! Show how to tile part of your page with these H-tiles.
   Colour your drawings.

9. Ask your teacher if you can draw 1 or 2 of the shapes from Questions (1) - (7) on 1 cm paper and display the best drawings.

10. Look at each shape below.
    Which shapes would make good tiles (write yes or no) :-

    a
    b
    c
    d
    e
    f
    g
    h
    i
    j
    k
    l
Circles

The CIRCLE is the most perfect of all mathematical shapes.

It has lots of lines of symmetry and looks the same no matter which way you view it.

The RED line right through the centre is called the diameter of the circle.

The BLUE line from the centre to the edge is called the radius of the circle.

Exercise 3

1. Make a list of 10 objects, in the classroom, outside or at home which are circular.
   (Circular means "in the shape of a circle").

2. a Use a 2 pence or 10 pence coin to draw round and form a circle.

   b Draw a line through its centre and write in the word “diameter”.

   c Measure the diameter of your circle (in mm).

3. a Use a coin and a ruler to draw this pattern.

   b Colour your shape.

   c Measure and write down the length and the breadth of your shape.
4. Use your **coin** and a **ruler** to draw this triangular shape and colour it in.
   *(Hint - draw the circles first)*

5. Create this shape using **4 circles**.

6. Draw **half-way** round your coin to create this pattern formed from 2 "**half**" circles and a **rectangle**.

7. **This one is quite difficult to make.**
   It is made from 3 **half-circles** and a **rectangle**.
   **Try it.**

8. Now try to create 2 or 3 different patterns of your own using circles or half circles and show your teacher.

9. Find a large circle (a lid, cup) and create various patterns by drawing round the circles.
   Show these to your teacher - you may like to redraw the best onto card and display them.

**Optional:** It is possible to draw larger circles using a **pin**, a **piece of string** (wool or thread) and a **pencil**.
You will need a drawing pin and a short piece of string for this.
   *(See next page)*
10.  

a. Form a small loop at both ends of the piece of string.

b. Push the pin through one loop and hold it against the piece of paper.  
   (do not push the pin too hard or you may damage the surface)

c. Put the pencil point through the other loop and carefully draw round the pin.  
   (keep the string tight at all times)
   - you should have drawn a fairly neat circle.

d. Draw a line from the centre to the edge and write the word RADIUS beside it.

11.  

By shortening the string a little, try to create this “ring shape” and colour it in.

12. Try to create this “bulls eye” pattern.

Using Compasses

A special mathematical instrument used to draw circles is called a “pair of compasses”.

By placing the point firmly on your jotter and lightly rotating the pencil, perfect circles can be created.
Exercise 4

(You will need a pair of compasses and a ruler here)

1. Set your compasses so that the distance from the sharp point to the pencil point is 3 centimetres. (this is called the RADIUS of the circle)
   
   a. Draw a neat circle with radius 3 cm.
   b. Draw in the radius and mark it with 3 cm.
   c. Colour in your circle.

2. Use your compasses to draw a circle with radius 6 cm.

3. Try to draw this set of circles.

   ![Set of circles](image)

4. Use your compasses and your ruler to draw this half circle. (what radius must you use?)
   Colour your half circle. (it is called a semi-circle - semi means half)

5. Use your compasses to draw this quarter circle.

   ![Quarter circle](image)
6. Try to draw each of the following shapes accurately and colour them in.

   a. 
   
   
   3 cm
   3 cm
   3 cm
   3 cm

   b. 
   
   4 cm
   2 cm
   6 cm

   c. 
   
   8 cm
   6 cm
   4 cm

   d. 
   
   4 cm
   4 cm
   4 cm

   e. 
   
   2 cm
   2 cm
   2 cm
   2 cm

   f. 
   

7. a. Set your compasses to a radius of 4 cm and draw a whole circle.

   b. Keep the radius of 4 cm - put the compass point at P and draw the part circle (blue).
      It meets the big circle at Q.

   c. Now move your compass point to Q and repeat.

   d. Repeat until you have drawn this shape and colour it.

8. Re-draw some of the above shapes on card and create your own designs to make a display.
1. Listed below are eight mathematical shapes. Write down the four which are 2-dimensional.

- Circle
- Cube
- Rectangle
- Sphere
- Kite
- Pentagon
- Pyramid
- Line.

2. Look at this shape.
   a. Name the shape.
   b. How many edges does it have?
   c. How many corners does it have?

3. Think of a cube!
   a. How many faces does it have?
   b. What shape are all of these faces?

4. Here is a triangular prism.
   a. How many faces does it have?
   b. How many of these faces are rectangles?
   c. How many of the faces are triangles?

5. On \(\frac{1}{2}\) cm squared paper, make an accurate drawing of this triangle.

6. On \(\frac{1}{2}\) cm squared paper, draw this rectangle in the centre of the page and colour it in.
   Surround your rectangle with 8 more similar rectangles and colour them in with different colours.
7. Draw this kite-shaped tile and show that it does “tile”, by surrounding it completely with similar tiles.

8. Which of the shapes shown below would make “good tiles”?

- a
- b
- c
- d

9. a Use a Pair of Compasses to draw a circle with radius 7 centimetres.
   b Draw a line to show a diameter and write the word diameter along this line.
   c Measure the diameter with a ruler.
   d How does the diameter of any circle compare with its radius?

10. Use your compasses to draw this semi-circle :-
Chapter 9

A Right Angle

Your teacher will give you a rectangular piece of card.

Tear a corner piece from the card, about 5 cm by 5 cm in size. This will be your template which you can use to find a right angle.

If your template fits exactly into an angle then the angle will be a right angle. 
(We mark it with a small box)

The angle may be smaller than a right angle.

The angle may be larger than a right angle.

Exercise 1

1. Use your template to find out which of the following shapes are right angles. Write YES or NO.

   a  b  c
   d  e  f

   this is Chapter Nine
2. Using your template, write down how many right angles there are in the figures shown below:

\[ a \]  \hspace{1cm}  \[ b \]

3. Here is the badge of the NewtonVale Rugby Club.

Use your template to decide if the angles are Right Angles (R), Bigger than a right angle (B) or Smaller than a right angle (S).

Answer: 1 is Smaller. 2 is ...........

4. Steve potted the black ball into a centre pocket to win a game of snooker.

The path the ball took showed how lucky Steve was to win.

Use your template to find out which angles are:

a right angled,
b bigger than a right angle,
c smaller than a right angle.
5. Look at the picture of a house. How many **right angles** can you see? (at least 60 !)

6. Copy the following shapes onto squared paper and mark each right angle with a box.
Quarter-turn, Half-turn and Complete Turn

As the hand of a clock moves from the 12 round to the 3 it sweeps through a right angle - 90°.
This is known as a Quarter-turn.

As the hand of a clock moves from the 12 round to the 6 it sweeps through 2 right angles - 2 x 90° = 180°.
This is known as a Half-turn.

As the hand of a clock moves from the 12 right round to the 12 again it sweeps through 4 right angles - 4 x 90° = 360°.
This is known as a Complete-turn.
or One Revolution.

Exercise 2

1. How many degrees are there in a :-
   a quarter-turn     b half-turn     c complete turn ?

2. How many degrees does the minute hand move through on these clock faces ?
   a  b  c

this is Chapter Nine  page 104  ANGLES
3. On a clock face, how many degrees does the minute hand sweep through when it moves clockwise from the:—

- a 6 round to the 9
- b 7 round to the 1
- c 2 round to the 5
- d 3 round to the 12
- e 5 round to the 8
- f 8 round to the 5
- g 4 round to the 4
- h 1 round to the 10
- i 12 round to the 1

**Types of Angles**

- **Right Angle**
  This angle is called a **right angle**.
  It measures exactly 90°.

- **Acute Angle**
  This angle is called an **acute angle**.
  It is smaller than 90°.

- **Obtuse Angle**
  This angle is called an **obtuse angle**.
  It is larger than one right angle but smaller than two right angles.
  It measures larger than 90° but smaller than 180°.

- **Straight Angle**
  This angle is called a **straight angle**.
  It is formed from two right angles and measures exactly 180°.
Exercise 3

1. Use a word from the list above to describe the coloured angles below:

   a 
   b 
   c 

   d 
   e 
   f 

   g 
   h 
   i 

2. What type of angle is shown coloured in the following triangles:

   a 
   b 
   c 

   d 
   e 
   f
3. Look at the angles marked \( a, b, c, d, e, f, g \) and \( h \). Write down what type of angle each one is:

4. Copy the diagrams shown opposite.

Match the type of angle with its correct size by drawing arrows between them.

5. Write down which of these angle sizes are less than 90°:

   * 40°
   * 100°
   * 145°
   * 25°
   * 62°
   * 172°
   * 88°
   * 91°

6. Write down which of these angle sizes are bigger than 90° but less than 180°:

   * 65°
   * 105°
   * 178°
   * 87°
   * 150°
   * 189°
   * 92°
   * 5°

7. Write down whether these angles are acute, obtuse, right or straight:

   a. 20°
   b. 120°
   c. 75°
   d. 90°
   e. 135°
   f. 5°
   g. 179°
   h. 84°
   i. 180°
   j. 100°
   k. 1°
   l. 137°

8. When the acute angle 70° is added to the acute angle 60° an obtuse angle is made (130°).

   What kind (type) of angle is made when you add:

   a. 60° + 50°
   b. 40° + 30°
   c. 90° + 20°
   d. 90° + 90°
   e. 70° + 80°
   f. 45° + 45°
   g. 70° + 110°
   h. 25° + 64°
   i. 25° + 65°?
1. Use your right-angled template to find out which of these angles are right angles. Answer YES or NO.

   a \hspace{2cm} b \hspace{2cm} c

2. Use your template to decide if angle a, b, c and d in the shape below is Right Angled (R) Bigger than a right angle (B) Smaller than a right angle (S)

3. How many degrees are there in a :-
   a right angle   b straight angle   c quarter-turn
   d half-turn     e complete turn ?

4. On a clock face, how many degrees does the minute hand turn through when it moves clockwise from the :-
   a 1 round to the 4   b 2 round to the 8   c 3 round to the 3 ?

5. Use a word from - acute, right, obtuse or straight to describe the coloured angles :-

   a \hspace{2cm} b \hspace{2cm} c \hspace{2cm} d

6. Write down whether these angles are acute, right, obtuse or straight :-
   a 30°   b 140°   c 90°   d 3°
   e 178°   f 180°   g 89°   h 91°.
Calculators should NOT be used anywhere in this chapter.

What is a Fraction?

Imagine you have a pizza and cut it into 8 equal bits.
Each bit is “1 out of the 8” bits.
We can write this as a fraction as “one eighth” or :- \( \frac{1}{8} \)

Exercise 1

1. What fraction of this square is coloured red?

2. What fraction of this circle is coloured red?

3. What fraction of each shape is the red bit.

\( \begin{array}{cccc}
\text{a} & \text{b} & \text{c} & \text{d} \\
\end{array} \)
4. This rectangle has been split into 4 parts.

*Copy* these 2 sentences and complete them :-

“..... of the **4 parts** of the rectangle are **red**”.

=> “This means that \( \frac{3}{4} \) of the rectangle is **red**”.

5. a Name of this shape ?
   b How many parts has it been split into ?
   c How many parts are **red** ?
   d What fraction of the shape is **red** ?

6. What fraction of each shape is coloured ?

   a
   b
   c
   d
   e
   f
   g
   h

Look again at the eight shapes in question 6 above.

Can you see that for question 6 a :-

\[ \cdot \frac{2}{3} \text{ of the shape is coloured ?} \]

=> So \[ \cdot \frac{1}{3} \text{ of the shape is NOT coloured ?} \]

7. a What fraction of shape 6 b (above) is **NOT** coloured ?
   b Write down the fraction of each shape in question 6 which is **NOT** coloured ?
8. a. Make a neat copy of this circle.
   (use a coin or circular object to draw it)
   b. Use coloured pencils to show $\frac{3}{4}$ of it in red.

9. a. Use a ruler to make a neat drawing of this rectangle.
   b. Colour $\frac{5}{8}$ of it blue.

10. Trace, or draw this triangle and colour $\frac{3}{4}$ of it brown.

11. a. Draw this square. Split it as shown.
   b. Colour in $\frac{5}{8}$ of it orange.

12. Of the 5 children at the party, 2 of them were boys.
   Can you see that :-
   "2 out of the 5 were boys" ?
   or, written as a fraction :-
   "$\frac{2}{5}$ of the children were boys"

13. Of the 7 counters, 1 is red, 2 are blue and the rest are orange.
   a. What fraction (of the 7) is red ?
   b. What fraction is blue ?
   c. What fraction is orange ?
14. These are all the coins in Lucy’s purse.
   a How many coins are there altogether ?
   b How many of them are 2p’s ?
   c What fraction of them are 2p’s ?
   d What fraction of them are 5p’s ?
   e What fraction of them are 20p’s ?

15. Frani’s motorcycle journey lasted 10 minutes.
   Of this, he was on the motorway for 7 minutes.
   What fraction of the 10 minute trip was Frani on the motorway ?

16. Tim gets £5 pocket money every week.
   Last week he spent £3 of it in MacBurgers.
   What fraction of his pocket money did Tim spend in MacBurgers ?

17. a What fraction of these candles are lit ?
    b What fraction is NOT lit ?

18. The eye-colours of 12 girls are shown below.

<table>
<thead>
<tr>
<th>Jane</th>
<th>blue</th>
<th>Lucy</th>
<th>brown</th>
<th>Alice</th>
<th>brown</th>
<th>Mari</th>
<th>blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annie</td>
<td>brown</td>
<td>Karen</td>
<td>blue</td>
<td>Nicki</td>
<td>brown</td>
<td>Lynn</td>
<td>green</td>
</tr>
<tr>
<td>Paula</td>
<td>green</td>
<td>Shona</td>
<td>brown</td>
<td>April</td>
<td>blue</td>
<td>Cath</td>
<td>green</td>
</tr>
</tbody>
</table>

   a What fraction of the girls had blue eyes ?
   b What fraction had brown eyes ?
   c What fraction of the girls had green eyes ?
   d What fraction did NOT have blue eyes ?

19. a Write down all the days of the week.
    b Which days make up the week-end ?
    c What fraction of a whole week is the week-end ?
Equivalent Fractions

This rectangle has been divided up in TWO different ways :-

1 out of the 2 bits is shaded pink = \( \frac{1}{2} \)
2 out of the 4 bits are shaded pink = \( \frac{2}{4} \)

Can you see from the diagrams that the two fractions \( \frac{1}{2} \) and \( \frac{2}{4} \) are EQUAL?

Exercise 2

1. This circle has been divided into 3 equal parts.
   a. What fraction of the circle is coloured blue?
   b. The same circle has been divided into 6 parts this time.
      What fraction this time is coloured blue?

Can you see that the same amount has been coloured blue both times?

c. Copy this sentence and finish it :-
   “The 2 diagrams show that the fractions \( \frac{2}{3} \) and \( \frac{6}{9} \) are equivalent”. ("equivalent" means "the same as").

2. Use the two drawings opposite to write down the 2 fractions that are shown to be equivalent to each other.
3. Use each pair of drawings below to write down the 2 fractions that are shown to be equivalent to each other.

\[
\begin{align*}
\text{a} & \quad \frac{3}{4} \\
\text{b} & \quad \frac{2}{3} \\
\text{c} & \quad \frac{5}{8} \\
\text{d} & \quad \frac{7}{9} \\
\text{e} & \quad \frac{1}{2} \\
\text{f} & \quad \frac{3}{4}
\end{align*}
\]

It is possible to simplify a fraction like \(\frac{6}{10}\) as long as both the “top” part and the “bottom” part of the fraction can both be divided by the same number.

\[
\begin{align*}
\Rightarrow \text{To simplify } \frac{6}{10}, \text{ can you see that } 6 \text{ and } 10 \text{ are part of the } \times 2 \text{ table?} \\
\Rightarrow \text{divide both the } 6 \text{ and the } 10 \text{ (by 2)} \Rightarrow \frac{6}{10} & \rightarrow \frac{6 \div 2}{10 \div 2} = \frac{3}{5}
\end{align*}
\]

Two more examples:

\[
\begin{align*}
\frac{8}{12} & \rightarrow \frac{8 \div 4}{12 \div 4} = \frac{2}{3} \\
\frac{15}{18} & \rightarrow \frac{15 \div 3}{18 \div 3} = \frac{5}{6}
\end{align*}
\]

4. Simplify the fraction \(\frac{4}{10}\) by dividing the 4 and the 10 by 2. \(\frac{4 \div 2}{10 \div 2} = \frac{2}{5}\)

5. Simplify the fraction \(\frac{5}{15}\) by dividing the 5 and the 15 by 5. \(\frac{5 \div 5}{15 \div 5} = \frac{1}{3}\)
6. Simplify each of the following by dividing top and bottom numbers by 2:
   a. \( \frac{8}{10} \)
   b. \( \frac{4}{14} \)
   c. \( \frac{12}{22} \)
   d. \( \frac{10}{18} \).

7. Simplify each of the following by dividing top and bottom numbers by 3:
   a. \( \frac{9}{12} \)
   b. \( \frac{3}{21} \)
   c. \( \frac{6}{15} \)
   d. \( \frac{21}{24} \).

8. Simplify each of the following by dividing top and bottom numbers by 5:
   a. \( \frac{5}{15} \)
   b. \( \frac{10}{25} \)
   c. \( \frac{30}{35} \)
   d. \( \frac{15}{40} \).

9. Simplify the fraction \( \frac{9}{15} \). (Hint: 9 and 15 are part of the \( \times \) table).

10. (Knowing your tables really helps here)***
    Simplify each of the following fractions as far as possible by dividing the top and the bottom parts by the same number each time:
    a. \( \frac{2}{10} \)
    b. \( \frac{3}{15} \)
    c. \( \frac{4}{12} \)
    d. \( \frac{5}{25} \)
    e. \( \frac{4}{18} \)
    f. \( \frac{12}{18} \)
    g. \( \frac{10}{30} \)
    h. \( \frac{15}{20} \)
    i. \( \frac{21}{28} \)
    j. \( \frac{20}{25} \)
    k. \( \frac{50}{60} \)
    l. \( \frac{24}{30} \)
    m. \( \frac{16}{24} \)
    n. \( \frac{7}{35} \)
    o. \( \frac{9}{21} \)
    p. \( \frac{10}{45} \).

11. 5 of Lucy’s 10 goldfish died in the bowl.
    a. Write this as a fraction. \( \frac{\ldots}{10} \)
    b. Now simplify this fraction.

12. Ben had 30 pence. He spent 20 pence on a drink.
    a. What fraction of his money did Ben spend?
    b. Simplify your answer.
13. Terry was cycling the **12 kilometres** to the coast. He got a puncture and stopped after **10 kilometres**.
   a. What fraction of the journey to the coast had Terry cycled before stopping?
   b. Simplify this fraction.

   **From now on, you must always simplify any fraction you get as an answer.**
   **You must never leave it “un-simplified”**.

14. There are **12 months** in a year.
   What fraction of a year are the Summer months? *(June, July and August)*

15. A bag contains **8 red** counters and **12 blue** ones.
   a. How many counters are there altogether?
   b. What fraction of the counters are **red**?
   c. What fraction are **blue**?

16. Lucy had **6 pence**, Nick had **4 pence** and Ben had **10 pence**.
   a. How much had they altogether?
   b. What fraction of the total amount did Lucy have?
   c. What fraction did Nick have?
   d. What fraction did Ben have?

17. Gemma wrote down how long she spent doing various things last Monday.
<table>
<thead>
<tr>
<th>Gemma’s Monday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slept - 8 hours</td>
</tr>
<tr>
<td>School - 6 hours</td>
</tr>
<tr>
<td>Watched T.V. - 4 hours</td>
</tr>
<tr>
<td>Played outside - 3 hours</td>
</tr>
<tr>
<td>Did Homework - 1 hour</td>
</tr>
<tr>
<td>Ate meals - 2 hours</td>
</tr>
</tbody>
</table>
   a. How many hours are there in a day?
   b. What fraction of the day did Gemma sleep?
   c. Write down what fraction of Monday Gemma spent -
      i. at school     ii. watching T.V.
      iii. playing outside iv. doing homework
      v. eating?
Fraction of a Quantity

To find a fraction (like $\frac{1}{2}$) of something → you divide.

$\frac{1}{2}$ of 12p means “12p divided by 2” = 6p.

$\frac{1}{3}$ of 21p means “21p divided by 3” = 7p.

$\frac{1}{8}$ of 40p means “40p divided by 8” = 5p.

Exercise 3

1. Copy and complete :-

"$\frac{1}{2}$ of 20p means “20p divided by 2” = ... p”.

2. Copy and complete :-

“$\frac{1}{4}$ of 36 cm means “36 cm divided by ...” = ... cm”

3. Find :-

a $\frac{1}{2}$ of 80p    b $\frac{1}{3}$ of 21 metres    c $\frac{1}{5}$ of 45 grams

d $\frac{1}{10}$ of £40    e $\frac{1}{4}$ of 24 litres    f $\frac{1}{6}$ of £66

g $\frac{1}{8}$ of 32 cm    h $\frac{1}{7}$ of 28p    i $\frac{1}{3}$ of 39p

4. 24 friends were watching Scotland play football on T.V.
    $\frac{1}{3}$ of them were women.

   a How many women were watching the game ?
   b How many men must there have been ?
5. It is 36 miles from my home town to Edinburgh by train.
   The train broke down when I was only \( \frac{1}{4} \) way along the journey.
   a) How far had I travelled?
   b) How far was I then from Edinburgh?

6. Lucy’s mum got a bunch of 30 flowers from her dad on her birthday.
   \( \frac{1}{5} \) of them were red roses.
   How many red roses were there?

7. Most people sleep for about \( \frac{1}{3} \) of each day.
   How many hours is this?

8. Draw this rectangle (24 squares) on squared paper.
   a) What is \( \frac{1}{6} \) of 24?
   b) Colour \( \frac{1}{6} \) of the rectangle red.
   c) Colour \( \frac{1}{8} \) of it blue and \( \frac{1}{4} \) of it yellow.
   d) How many of the 24 squares are not coloured at all?

9. a) How many days are there in June?
    b) It rained on \( \frac{1}{6} \) of these days.
       How many days was this?
    c) I was on holiday for \( \frac{1}{3} \) of June. For how long was I on holiday?

10. A problem:– Of the money I had in my pocket, I spent \( \frac{1}{6} \) of it on sweets.
    The sweets cost 9 pence.
    a) How much money must I have had to begin with?
    b) How much money will I then have left?
Topic in a Nutshell

1. Say what fraction of each shape is coloured:
   - a
   - b
   - c
   - d

2. Shown are 4 bananas, 5 lemons and 2 pears.
   - a What fraction of the fruit is bananas?
   - b What fraction of the fruit is lemons?
   - c What fraction is neither bananas nor lemons?

3. Write down 2 fractions which are equivalent to $\frac{2}{3}$.

4. Simplify each of the following fractions by dividing the top and bottom parts by a number each time:
   - a $\frac{2}{8}$
   - b $\frac{10}{30}$
   - c $\frac{6}{8}$
   - d $\frac{10}{12}$

5. Ben had 90 pence. He bought two waffles for 60 pence.
   - a What fraction of his money did Ben have left?
   - b Simplify your answer.

6. Find the following quantities:
   - a $\frac{1}{2}$ of 30p
   - b $\frac{1}{3}$ of £18
   - c $\frac{1}{5}$ of 40 kg
   - d $\frac{1}{10}$ of 80 cm
   - e $\frac{1}{4}$ of 28 litres
   - f $\frac{1}{6}$ of 42 grams

7. Charlie went on holiday for 15 days.
   - a He went sunbathing on $\frac{1}{3}$ of these days.
   How many days was that?
   - b On $\frac{1}{5}$ of the days he sunbathed, his skin got burned.
   On how many days did his skin get burned?
From where the teacher is standing:

Jean is in front of Alan
Dave is behind Donna
Dave is to the left of Colin
Erin is to the right of Donna.

Sid points to Tom. When he turns clockwise, the 2nd person he points to is Joe.

Again, Sid points to Tom. When he turns anti-clockwise, the 3rd person he points to is Al.

A quarter turn (90°) clockwise takes the 12 to the 3.

A quarter turn (90°) anti-clockwise takes the 12 to the 9.

A half turn (180°) any way takes the 12 to the 6.

A complete turn (360°) either way takes the 12 on to the 12.
Exercise 1

1. Here is a teacher's seating plan for a small classroom.
   As the teacher looks at the plan, say who is sitting:-
   a  behind John.
   b  in front of Bert.
   c  to the left of Ann.
   d  to the right of May.
   e  2 seats behind Flo.
   f  3 seats to the right of Don.

2. The picture shows the display in a butcher's shop window.
   Name what is :-
   a  below the ham.
   b  above the kebabs.
   c  first right from the lamb.
   d  to the left of the salami.
   e  2 above the pie.
   f  3 below the T-bone steak.
   g  3 above the bacon rashers.
   h  2nd right of chicken drums.
   i  Describe where the pie is in relation to the drumsticks.
   j  Describe where the roast is in relation to the salami.
Look at the types of travel shown below.

3. Describe what is:
   a 1 above the yellow taxi.  
   b just below the bus.  
   c first right of the blue jeep.  
   d 2nd to the left of the tram.  
   e 1 below the sports car.  
   f 2nd to the right of the tractor.  
   g 3rd left of the bus.  
   h 1 to the left and 1 up from the tram.  
   i 1 to the right and 1 down from the helicopter.  
   j 2 up and 3 to the left from the rickshaw.

4. Describe fully how would you get from:
   a the ship to the bus?  
   b the truck to the helicopter?  
   c the sports car to the pram?  
   d the tram to the old old car?

5. If you were sitting in each of these, and facing front,
   a what would be on your left if you were in the taxi?  
   b what would be on your right if you were in the tram?  
   c what would be 2nd on your left if you were in the plane?  
   d what would be 2nd on your left if you were in the old car?
6. A photographer is at the nursery school, taking pictures. He takes Brenda’s picture first.

   a Turning clockwise :-
      i whose turn is it next?
      ii after that, he moves on 3 places - whose turn now?
      iii then, he moves on a further 2 places - whose turn now?

   b Turning anti-clockwise :-
      i whose is the first baby the photographer points to after Brenda?
      ii after that, he moves on 3 places - whose turn now?
      iii then, he moves on a further 3 places, but he is puzzled - why?

   c Who has not had their picture taken, either clockwise or anti-clockwise?

   d Brian crawls clockwise round the circle. Who is the fourth person he comes to?

   e Henry crawls anti-clockwise round the circle. Who is the sixth person he comes to?

7. Some children are playing a game of “dares” in the garden. Lucy is in the middle. She first points to Chalmers.

   a From Chalmers, Lucy makes a quarter turn clockwise. Who is she now pointing to?

   b Lucy then points to Richard and makes a quarter turn anti-clockwise. Who is she now pointing to?

   c Lucy then points to Jim and makes a quarter turn anti-clockwise. Who is she pointing to now?
d Lucy points to Mary and makes a **half turn**. Who is she now pointing to?

e She now points to Ian and makes a **complete turn**. Who is she pointing to?

f Lucy points to Karen and then decides to point to Jim. Describe **two different kinds of turn** Lucy could make to do this.

---

### Features of a Journey

#### Describing a Journey

Ben is playing in a maze. He has been given the instructions so he can follow the coloured pathway out of the maze.

**Example**

```
[Diagram of a maze with arrows indicating steps and turns]
```

- **Take 2 steps forward**
- **Turn right**
- **Take 2 steps forward**
- **Turn left**
- **Take 3 steps forward**
- **Turn left**
- **Take 2 steps forward**
- **Turn right**
- **Take 2 steps forward**

---

### Exercise 2

1. Write clear instructions for each pathway through the maze for Ben:

   a
   b
   c

---

this is Chapter Eleven page 124

POSITION AND MOVEMENT
2. This is a map of the village where Nick lives.

When Nick goes to the Chinese Restaurant he comes out of his house, turns right along Bond Street, turns 2nd right into Dale Road, then 1st left into Read Street. The restaurant is the 1st building on the left.

a) Nick wants to go to the temple.

Copy and complete these directions for his journey:
Come out of Nick's house, turn left into ........ Street, turn 1st .......... into .............. Road. The temple is the ........ building on the right.

b) Nick has to go to the bank.

Copy and complete these directions for this journey:
Come out of Nick's house, turn right into ........ St., turn 1st ........ into ............. St. Walk along John St. and take the ........ road on the left. This is ........ St. The bank is the ...... building on the ........ .

c) Nick wants to go and visit the windmill.

Write down directions for Nick, from his house to the windmill.

d) Nick comes out of the library and heads for the airport.

Write down directions for him, from the library to the airport.

e) Nick visits his dad at the factory each day on his way home from school.

Describe his journey home from school, going to his dad's factory.

f) PC Plodd leaves the police station to go to pick up Farmer Giles.

They both then head for the golf club. Plan one possible journey.
3. Look at the map of Westlea. To get from the fire station to the shops -

“Come out of the fire station, turn left & go forward 5 spaces.
Now turn left and go forward 2 spaces - you’re at the shops!”

Write one set of instructions on how to get from :-

a. the shops to the police station.
b. the school to the golf course.
c. the train station to the football stadium.
d. the petrol station to the harbour.

A copy of this map is available as W'Sheet 11.1

4. Follow these routes on the map with your finger and say where they end.

a. “Come out of the cathedral; turn right; go forward 4 spaces; turn right; go forward 3 spaces; turn left - where are you?”
b. “Come forward 3 spaces out of the Lake; turn left and go on 9 spaces; turn left and go forward 3 spaces - what is on your right?”
c. “Come 2 spaces out of the football stadium; turn right and go forward 4 spaces; turn left and go forward 5 spaces; turn left again and again go forward 5 spaces; turn right and go forward 4 spaces; look right - what’s there?”
**Compass Points**

You should already know that the 4 main points of the compass are:- NORTH, SOUTH, EAST & WEST

Remember :-
- $360^\circ = 1$ full turn
- $180^\circ = \frac{1}{2}$ turn
- $90^\circ = \frac{1}{4}$ turn

**Example** - Back to the maze again!

Go East 2 squares
Go South 2 squares
Go East 3 squares
Go North 2 squares
Go East 2 squares

This time our instructions were given using compass points.

**Exercise 3**

1. In which direction would Ben end up facing if he was facing :-
   a. North and turned through $180^\circ$ ?
   b. West and turned through $90^\circ$ clockwise ?
   c. South and turned through $90^\circ$ anti-clockwise ?
   d. East and turned through a three quarter turn clockwise ?
   e. North and made a complete turn of $360^\circ$ ?

2. How many degrees would Ravi have to turn through if he was facing :-
   a. East and turned clockwise to face South ?
   b. West and turned to face East ?
   c. North and turned anti-clockwise to face West ?
   d. South and turned clockwise to face East ?
   e. West and made a complete turn to face West again ?
3. Give instructions using the points of the compass to help Spot, Nick, Tiddles and Lucy through the mazes:

![maze images](images)

4. Draw up a 6 by 6 grid like the one shown. Now Jane has to find the pathway out of the maze starting at the top left-hand corner.

Draw Jane’s pathway following these instructions:

- Go 3 boxes East.
- Go 5 boxes South.
- Go 2 boxes East.
- Go 4 boxes North.
- Go 2 boxes East to get out of the maze!

5. Draw up another 6 by 6 grid.

Draw another pathway following these instructions:

- Start at the bottom left-hand box, facing North.
- Go 2 boxes North then 3 boxes East.
- Now Go 2 boxes North and 1 then box East.
- Go 1 box North again and then 3 boxes West.
- Go 2 more boxes North to get out of the maze!
6. Look at the map of the Carribean.

The pirates are sailing from island to island in search of hidden treasure.
You have to find where each voyage ends.

a Leave Palm Tree Island harbour;
Go West 3 spaces; then North 8 spaces.

b Leave Volcano Island harbour;
head South 1 space; West 7 spaces; North 5 spaces; West 1 space; North 4 spaces; then 5 spaces East.

c Leave Rock Island harbour;
Go 7 spaces South; 2 spaces West; 6 spaces South; 2 spaces East; 4 spaces South; then 2 spaces East. OOPS!

A copy of this map is available as

W'Sheet 11.2

7. Use your map for question 6 to plot a route from Waterfall Island harbour to Rock Island harbour.
You must use the points of the compass to describe your journey.
The position of an object or point can be described by using a **COORDINATE GRID**.

The position of an object or point can either be given by stating

- which **square** the object is sitting in, or
- which **two lines** the point is on.

**Example 1**

The position of the fox is **Bd**.

The position of the bear is **Eb**.

**Example 2**

The position of the dog is **C5**.

The position of the cat is **F3**.

**Exercise 4**

1. Four areas in a zoo are shown in the coordinate grid.

   Write down the position of :-
   a) the lion.
   b) the penguin.
   c) the tiger.
   d) the giraffe.
2. Six subject rooms in a school are shown in the coordinate grid.
   Write down the position of :-
   a  Mathematics M.
   b  English E.
   c  Geography G.
   d  History H.
   e  Art A.
   f  Computing C.

3. The letter P is in position D9.
   Write down the positions of the other capital letters :-
   Q, R, S, T, U, V and W.

4. Eight soldiers are out on a training exercise in a field.
   Name the soldier who is in position :-
   a  D2.   b  B4.
   c  A9.   d  J3.
   e  K6.   f  F5.
   g  I10.  h  G0.
5. At the school fayre Joyce was in charge of a stall where you could win cash prizes.

You had to push a pin through a hole on a piece of card.

Some of the positions had no prizes!

For example: -

land on B1 - win £1, land on C0 - lose.

a) What did you win if you pushed the pin through position:

i) D3         ii) E4

iii) B2       iv) F3

v) C1     vi) A0

b) Which positions give a 10p prize? (List all of them).

c) What was the top prize and what was its position?

6. A small zoo has been built as shown on the grid.

a) In this zoo, name:

i) 3 members of the cat family.

ii) 3 birds.

b) What kind of sea creature appeared in “Jaws”? Write down its position.

c) “Cunning as a…” Write down its name and position.

d) What kind of creature is a cobra? Write down the position of where it might live in the zoo.

e) What is the position on the pathway between the foxes and the chimps?
Coordinates for Fun

Exercise 5

Pictures can be drawn using coordinates.
Make a coordinate grid for each picture (you are guided as to what size).
Plot the points in order and join them up as you move from one point to the next.

   Numbers upwards - 0 - 8.
   Set 1 - D2  D3  F3  F2  D2.
   Set 2 - B4  B6  H6  H4  B4.
   Set 3 - D7  D8  F8  F7  D7.
   What mathematical sign is this?

   Numbers upwards - 0 - 8.
   Set 1 - D1  D3  B3  B5  D5  D7  F7  F5  H5  H3  F3  F1  D1.
   What mathematical sign is this?

   Numbers upwards - 0 - 20.
   Set 1 - D2  D10  F12  F4  D2.
   Set 2 - F4  H3  J3  L4  L16  J15  H15  F16  F12.
   Set 3 - L12  N10  N2  L4.
   Set 4 - F16  I20  L16.
   Set 5 - I11  I1. What flying object is this?

4. Letters A - L.
   Upwards 0 - 11.
   Set 1 - D3  E3  F4  G3  H3  H6  D6  D3.
   This has to do with football. What is it?
5. Letters across  A - M.
Numbers upwards  0 - 11.
Set 1 - F11  E10  G10  F11.
Set 2 - E10  E8  G8  G10.
Set 3 - E8  D8  D4  H4  H8  G8.
Set 4 - D8  B6  B5  C5  C6  D7.
Set 5 - H8  J6  J5  I5  I6  H7.
Set 6 - D4  D3  C3  C2  F2  F4.
Set 7 - F2  I2  I3  H3  H4.
He was in the **Wizard of Oz**.
Who is he?

Numbers upwards  0 - 12.
Set 1 - F12  E9  G9  F12.
Set 2 - G9  H8  D8  E9.
Set 3 - D8  D2  H2  H8.
Set 4 - E2  E4  G4  G2.
Set 6 - H2  J2  J6  H7.
Set 7 - F4  F2.
It's a building. What kind?

7. Letters across  A - I.
Numbers upwards  0 - 11.
Set 1 - E11  F11  F9  H7  H3  G2  D2  C3  C7  E9  E11.
Set 2 - F10  E10.
Set 4 - D5  E5.
Have this with your **burger**?
1. Look at the type of insects shown below.

![Insects Diagram](image)

a Describe what insect is :-

i 1 above the *mosquito*.  
ii 2 below the *caterpillar*.  
iii first right of the *snail*.  
iv 3rd to the left of the *fly*.  
v 2 down and 2 to the right of the *butterfly*.

b If you are the *snail* and are looking at the *mosquito* - what insect would you be looking at if you made a *quarter-turn clockwise*?

c If you are the *mosquito* and are looking at the *ladybird* - what insect would you be looking at if you made a *quarter-turn anticlockwise*?

2. Write clear instructions on how to get Ben through the maze. Start with ...

   "forward 2 spaces then ...."

3. Now write another set of instructions for Ben to get him through the same maze, this time using the *points of the compass* :-

   e.g. “Go *East* 2 squares, .........."
4. a If I was facing **North** and turned through **90°** anticlockwise, in which direction would I then be facing?

   b How many degrees will I have to turn through if I am facing **West** and want to face **East**?

5. Write down the coordinate positions of the:
   a rooster  
   b chick  
   c pig  
   d bull.

6. You draw one more for fun!

   Letters across  A – N.
   Numbers upwards  0 – 11.

   Set 1 - B7  D3  L3  M7  B7.
   Set 2 - D7  D10. draw a at D10.
   Set 3 - F7  F8. draw a at F8.
   Set 4 - H7  H9. draw a at H9.
   Set 5 - J7  J11. draw a at J11.
   Set 6 - L7  L9. draw a at L9.

   What is it this time?
Estimating Length

When measuring a length or distance, you can use many different devices.

- A ruler measures small lengths in centimetres (cm).
- A tape measure measures larger lengths in metres (m).
- A car odometer measures in kilometres (km).

Exercise 1

1. Would you use a ruler, tape measure or a car odometer to measure:
   
   a) the length of this book  
   b) the height of your classroom  
   c) your own height  
   d) the length of the corridor  
   e) the length of your thumb  
   f) how far from Glasgow to Edinburgh?

2. Estimate (guess) the length or distance of each part in question 1.

3. Spread out your hand on a sheet of paper and draw around it.

   Estimate the length of:
   
   a) your hand-span  
   b) your longest finger  
   c) your pinky finger.

4. Measure each of the three lengths in question 3.
5. Put your foot on a sheet of paper and draw around it.
   
   Estimate :-
   
   a the length of your foot
   b the width of your foot.
   c Now measure both and check how close you were.

6. Estimate the length of each coloured line to the nearest centimetre :-

   a
   
   b

   c

   d

   e

   Now measure each of the lines and check how close you were.

7. Estimate the length of each object below in centimetres :-

   a

   b

   c

   d

   Now measure each of the objects and check how close you were.
Exercise 2

1. Use a ruler to draw a line of length :-
   a) 3 centimetres  
   b) 7 centimetres  
   c) 9 centimetres  
   d) 6 centimetres  
   e) 1 centimetre  
   f) 16 centimetres.

2. Use a ruler to draw a line of length :-
   a) $2\frac{1}{2}$ cm  
   b) $4\frac{1}{2}$ cm  
   c) $5\frac{1}{2}$ cm  
   d) $10\frac{1}{2}$ cm.

3. Shown below are sketches of rectangles.
   Draw each rectangle accurately.

   a) 
   b) 
   c) 
   d) 

4. Draw each of the following shapes accurately :-
   a) a rectangle with length 6 cm and breadth 2 cm.  
   b) a square with side 7 cm.

5. Look at this sketch of a right angled triangle.
   Draw it accurately.
Units of Length

Remember :-

A centimetre is a standard unit of length. It is about the width of your pinky nail.

A metre is exactly 100 centimetres. This is about the distance from the ground up to a door handle.

Exercise 3

1. Remember, **1 metre = 100 cm.** How many centimetres are in :-
   
   a 1 metre  
   b 2 metres  
   c 3 metres  
   d 4 metres  
   e 8 metres  
   f 5 metres  
   g 9 metres  
   h 10 metres ?

2. How many centimetres are in :-
   
   a \( \frac{1}{2} \) metre  
   b \( 1 \frac{1}{2} \) metres  
   c \( 2 \frac{1}{2} \) metres  
   d \( 5 \frac{1}{2} \) metres  
   e \( 7 \frac{1}{2} \) metres  
   f \( 9 \frac{1}{2} \) metres  
   g \( 10 \frac{1}{2} \) metres  
   h \( 12 \frac{1}{2} \) metres  
   i \( \frac{1}{4} \) metre  
   j \( 1 \frac{1}{4} \) metres  
   k \( 2 \frac{1}{4} \) metres  
   l \( 4 \frac{1}{4} \) metres ?

3. Remember, **100 cm = 1 metre.** How many metres are in :-
   
   a 500 cm  
   b 700 cm  
   c 900 cm  
   d 1000 cm  
   e 600 cm  
   f 1200 cm  
   g 1500 cm  
   h 2300 cm ?

4. How many metres are in :-
   
   a 50 cm  
   b 250 cm  
   c 650 cm  
   d 850 cm  
   e 150 cm  
   f 950 cm  
   g 1150 cm  
   h 1450 cm  
   i 25 cm  
   j 325 cm  
   k 525 cm  
   l 1025 cm ?
Remember :- 1 metre 25 centimetres = 1 m 25 cm = 125 cm

5. Copy and complete :-
   a 1 metre 75 centimetres = 1 m 75 cm = ..... cm
   b 1 metre 53 centimetres = ... m ... cm = ..... cm
   c 2 metres 25 centimetres = ... m ... cm = ..... cm
   d 5 metres 20 centimetres = ... m ... cm = ..... cm

   Be very careful with these :-
   e 1 metre 5 centimetres = ... m ... cm = ..... cm
   f 7 metres 8 centimetres = ... m ... cm = ..... cm
   g 10 metres 1 centimetre = ... m ... cm = ..... cm.

6. Copy and complete :-
   a 215 cm = 2 m 15 cm = 2 metres ... centimetres
   b 475 cm = 4 m ... cm = ... metres ... centimetres
   c 709 cm = ... m ... cm = ... metres ... centimetres
   d 208 cm = ... m ... cm = ......................
   e 1050 cm = ............. = ......................
   f 2003 cm = ............. = ......................

7. a A snail crawls along a garden path
   5 metres 45 centimetres long.
   How many centimetres did the snail crawl ?

   b A toy car runs along a track
   with length 365 centimetres.
   How many metres and centimetres is this ?

   c Nick sprinted for 20 metres and 8 centimetres.
   How many centimetres did he sprint ?
Problems involving Length

Exercise 4

1. **a** Put these lengths in order, **smallest** first:
   - 1 m 34 cm, 99 cm, 1 metre 29 centimetres, 170 cm.

   **b** Put these lengths in order, **largest** first:
   - 127 cm, 1 m 19 cm, 130 cm, 1 metre 9 centimetres.

2. Four toy cars are placed in a line bumper to bumper.

   Their lengths are 9 cm, 7 cm, 11 cm and 14 cm.
   What is the **total length** of all the cars?

3. A plank of wood is 225 cm long.
   A piece, 70 cm, is cut off.
   What is the **length** of the plank now?

4. A birthday banner is made from 13 sheets of paper. Each piece is 9 cm long.

   What is the **total length** of the banner?

5. A tortoise walks 450 centimetres.
   It takes a rest, then walks 2 \( \frac{1}{2} \) metres.
   How many metres in total did the tortoise walk?

6. Emily has a roll of cable 10 metres long.
   She cuts **4 lengths** of cable from the roll:
   - 3 metres, 270 centimetres, 1 \( \frac{1}{2} \) metres and 1 metre 40 centimetres.

   **a** What is the **total length** (in cm) of the four lengths of cable?

   **b** How many centimetres of cable are left on the roll?
**Area**

The *area* of a shape is the **AMOUNT OF SPACE IT COVERS**.

The area of a box 1 cm by 1 cm has an area of : 1 square centimetre.

This is written as : 1 cm\(^2\)

Example :– This shape has an area of 4 cm\(^2\)

**Exercise 5**

1. Write down the area (....cm\(^2\)) of this shape :–

2. Write down the area (....cm\(^2\)) of each shape below :

   a
   b
   c
   d
   e
   f
   g
   h
   i
3. Write down the area (\(\ldots \text{cm}^2\)) of each shape below:

\[\text{a} \hspace{1cm} \text{b}\]

\[\begin{array}{c}
\text{c} \hspace{2cm} \text{d} \hspace{2cm} \text{e}
\end{array}\]

4. Estimate the areas of these shapes. Use this simple rule:

- If more than \(\frac{1}{2}\) a box is covered \(\rightarrow\) count it as \(1\ \text{cm}^2\)
- If less than \(\frac{1}{2}\) a box is covered \(\rightarrow\) do not count it at all.

\[\text{a} \hspace{2cm} \text{b}\]
Area of a Rectangle - A Rule

We can find the area of a rectangle without counting squares on a grid.

We can find the area of a rectangle using a formula - another name for a rule.

The rectangle shown measures 3 cm by 2 cm.

Counting squares gives an area of 6 cm².

Also, multiplying 3 by 2 also gives us 6 cm².

The area of any rectangle can be found by:

MULTIPLYING THE LENGTH BY THE BREADTH.

It is easier to write it as:

Area = Length x Breadth

or

\[ A = L \times B \]

You must write down the formula and your calculation when finding the area of a rectangle.

Example

\[ A = L \times B \]

\[ A = 4 \times 2 \]

\[ A = 8 \text{ cm}^2 \]

Exercise 6

1. Copy each rectangle and complete each example to find the area:

   a

   \[ A = L \times B \]
   \[ A = 5 \times \ldots \]
   \[ A = \ldots \text{ cm}^2 \]

   b

   \[ A = L \times B \]
   \[ A = 5 \times \ldots \]
   \[ A = \ldots \text{ cm}^2 \]
2. Calculate the area (in cm\(^2\)) of each of the following rectangles:— (Remember to show your formula and calculation).

\[
\begin{array}{cc}
| a & b |
\end{array}
\]

\[
\begin{array}{cc}
| \text{5 cm} & \text{1 cm} |
\end{array}
\]

\[
\begin{array}{cc}
| \text{3 cm} & \text{4 cm} |
\end{array}
\]

\[
\begin{array}{cc}
| \text{6 cm} & \text{a square} |
\end{array}
\]

\[
\begin{array}{cc}
| \text{7 cm} & \text{4 cm} |
\end{array}
\]

\[
\begin{array}{cc}
| \text{5.5 cm} & \text{4 cm} |
\end{array}
\]

3. Calculate the area of each of the following rectangles:—

\[
\begin{array}{cc}
| a & b |
\end{array}
\]

\[
\begin{array}{cc}
| \text{5.5 cm} & \text{2 cm} |
\end{array}
\]

\[
\begin{array}{cc}
| \text{7.5 cm} & \text{4 cm} |
\end{array}
\]

4. A piece of red rectangular card measures 6 centimetres by 4 centimetres.

A blue rectangle measuring 4 cm by 2 cm is cut from the card.

a Find the total area of the red card.

b Find the area of the blue rectangle.

c Find the red shaded area.
1. Would you use a ruler, tape measure or a car odometer to measure :-
   a your pinky length  b the height of your house  
   c the width of this page  d the distance from Glasgow to London?

2. Estimate the length of each part in question 1 a, b and c.

3. Estimate (without using a ruler) the length of each of these lines :-
   a  
   b  
   c  
   d  

4. Use a ruler to draw a line :-
   a 3 cm long  b 12 cm long  c 4 1/2 cm long  
   d 10 1/2 cm long.

5. Change :-
   a 300 cm to m  b 700 cm to m  c 5 m to cm  
   d 10 m to cm  e 3 1/2 m to cm  f 650 cm to m.

6. Put these lengths in order, smallest first :-
   145 cm, 1 m 25 cm, 1 1/2 metres, 1 metre 30 centimetres.

7. Write down the area (in cm²) of this shape :-

8. Use a formula to calculate the area of the rectangle shown :-

\[
\text{Area} = \text{length} \times \text{width} \\
= 4 \text{ cm} \times 8 \text{ cm} \\
= 32 \text{ cm}^2
\]
Basic Patterns

Here are some examples of patterns:-

A drawing pattern :-

Letter patterns :-

A, C, E, G, I, K
Z, Y, X, W, V, U

Number patterns :-

2, 4, 6, 8, 10, 12
23, 19, 15, 11, 7, 3

Can you see how to make the next pattern in each example above?

Exercise 1

1. In each pattern below draw and colour in the next drawing :-

   a
   
   b

Calculators should NOT be used anywhere in this chapter.
2. Show the next two drawings in each pattern below:

   a. 
   
   b. 
   
   c. 
   
   d. 

3. Write down the next letter (or letters) in each pattern:

   (Hint: Write out the full alphabet first)

   a. G, H, I, J, ?
   b. T, S, R, Q, ?
   c. E, G, I, K, ?
   d. A, E, I, M, ?
   e. A, E, I, O, ?
   f. A, Z, B, Y, C, ?
   g. C, D, F, I, M, ?
   h. M, O, Q, S, U, W, ?
   i. AB, CD, EF, GH, ??
   j. ABC, CED, EFG, GHI, ??
4. Describe each of the following patterns by writing:

“It starts at ...... and goes up (or down) by ...... each time”.

a 1, 3, 5, 7, ...
b 5, 10, 15, 20, 25, ...
c 60, 50, 40, 30, ...
d 18, 15, 12, 9, 6, ...
e 10, 21, 32, 43, ...
f 20, 35, 50, 65, ...
g 13, 11, 9, 7, ...
h 100, 400, 700, 1000, ...
i 4, 4·5, 5, 5·5, 6, ...
j 750, 600, 450, 300, ...

5. Write down the next number in each of the patterns in question 4.

6. Write down the next number in each pattern:

a 5, 7, 9, 11, ?
b 20, 30, 40, 50, ?
c 8, 10, 12, 14, ?
d 5, 10, 15, 20, 25, ?
e 3, 6, 9, 12, 15, ?
f 4, 8, 12, 16, 20, ?
g 7, 14, 21, 28, ?
h 6, 10, 14, 18, 22, ?
i 40, 38, 36, 34, ?
j 30, 27, 24, 21, 18, ?
k 26, 22, 18, 14, ?
l 121, 110, 99, 88, 77, ?
m 8, 11, 14, 17, ?
n 1, 10, 19, 28, 37, ?

7. Write down the next number in each of these harder patterns:

a 64, 32, 16, 8, 4, ?
b 3, 6, 12, 24, ?
c 7, 8, 10, 13, 17, ?
d 80, 40, 20, 10, ?
e 121, 232, 343, 454, ?
f (1 x 2), (2 x 3), (3 x 4), (4 x 5), ?
8. **Copy** each number pattern below filling in **all** missing numbers:

a 12, 14, ?, 18, 20, ?
b 2, ?, 8, 11, 14, ?
c 54, 44, 34, 24, ?, ?
d 15, ?, 23, ?, 31, 35
e 55, 44, ?, 22, 11, ?
f 2, 7, ?, ?, 22, 27, ?
g ?, ?, 19, 17, 15, ?
h ?, 10, ?, 20, 25, 30, ?

9. Look at this **multiplication table** chart:

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Can you see the **yellow line** is part of the **2 times** table answers?

a **Copy** and complete:

“**the green line** is part of the ... **times** table answers”.

b **Describe** the number pattern on:

i **the blue line**

ii **the red line**

iii **the pink line**

iv **the grey line**

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**W'Sheet 13.1**

Mark it with coloured pencils any other number patterns that you can pick out.

d **Describe** each of these number patterns you have found, in a sentence.
Connections can be found between some of the multiplication tables. Look at the 3 times table.

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<tbody>
<tr>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>30</td>
</tr>
</tbody>
</table>

Now look at part of the 9 times table.

<table>
<thead>
<tr>
<th>9 x 1</th>
<th>9 x 2</th>
<th>9 x 3</th>
<th>9 x 4</th>
<th>9 x 5</th>
<th>9 x 6</th>
<th>9 x 7</th>
<th>9 x 8</th>
<th>9 x 9</th>
<th>9 x 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>18</td>
<td>27</td>
<td>36</td>
<td>45</td>
<td>54</td>
<td>63</td>
<td>72</td>
<td>81</td>
<td>90</td>
</tr>
</tbody>
</table>

or 3 x 3 x 1 = 9  
or 3 x 3 x 2 = 18  
or 3 x 3 x 3 = 27

Can you see a connection between the 3 and the 9 times tables?

Exercise 2

1. a Write out the 2 times table.
   b Write out the 4 times table.
   c Can you see a link between the 2 and 4 times tables? Explain this link.

2. a Write out the 4 and the 8 times tables.
   b Explain the link between these two tables.

3. a Show a link between the 5 and the 10 times tables.
   b Show a link between the 2 and the 8 times tables.
   c Show a link between the 2 and the 10 times tables.

4. Can you show other times table links? - INVESTIGATE
1. For each of the following patterns, draw and colour in the next drawing:-

   a
   b
   c

2. Write down the next letter in each pattern:-

   a  B,  D,  F,  H,  ?
   b  Q,  P,  O,  N,  ?
   c  A,  D,  G,  J,  ?
   d  AC,  BD,  CE,  DF,  ?

3. The number pattern - 1, 3, 5, 7, 9, ...
   "Starts at 1 and goes up by 2 each time"
   Describe the following number patterns in the same way:-

   a  4,  8,  12,  16, ..., b  26,  21,  16,  11, ..., c  8,  8·5,  9,  9·5, ..., d  640,  320,  160,  80, ..., e  131,  242,  353, ...

4. Write down the next number in each pattern:-

   a  6,  9,  12,  15, ? b  1,  2,  4,  8, ?
   c  100,  95,  90,  85, ? d  200,  100,  50, ?
   e  131,  242,  353, ? f  (1 x 4),  (2 x 5),  (3 x 6), ?

5. Copy each number pattern below and enter in all the missing numbers :-

   a  10,  12, ?,  16,  18, ? b  88, ?,  66,  55, ?,  33.
Calculators should NOT be used anywhere in this chapter except in the final exercise.

**3-D Shapes**

Flat shapes, drawn on paper, like squares, circles or triangles are called **2-dimensional**.

They have 2 "dimensions" or 2 sizes:
(- length and height)

Solid shapes, like cubes, cones and cylinders, are called "3-dimensional".

They have 3 "dimensions" or 3 sizes:
(- length, height and depth (or breadth))

You should know the words:
- cube, cuboid, cone, cylinder, sphere, triangular prism, square pyramid.

**Exercise 1**

1. Name each of the following 3-dimensional shapes:

   a. ![Cube](image)
   b. ![Cuboid](image)
   c. ![Sphere](image)
   d. ![Cone](image)
   e. ![Cylinder](image)
   f. ![Triangular Prism](image)
   g. ![Square Pyramid](image)
   h. ![Hemisphere](image)

---

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THREE DIMENSIONS
2. The objects below are made up of more than one 3-dimensional shape. List the different shapes each time:

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

3. If this flat (2-dimensional) shape was cut out and folded along the lines, it would make a 3-dimensional shape. Which shape?

4. Which 3-dimensional figures would you get if you cut the following shapes out and folded them up?
5.  

a  Make a list of as many objects as you can (at least 4) in the classroom, outside or at home which are in the shape of a cube.

b  Make a list of as many objects as you can (at least 4) in the classroom, outside or at home which are in the shape of a cuboid.

c  Make a list of as many objects as you can (at least 4) in the classroom, outside or at home which are in the shape of a cylinder.

d  Make a list of as many objects as you can (at least 4) in the classroom, outside or at home which are in the shape of a sphere.

e  Make a list of as many objects as you can (at least 4) in the classroom, outside or at home which are in the shape of a cone.
A good way of drawing solid 3-dimensional shapes like cubes and cuboids is to use triangular dotty paper (or isometric paper).

Look at how easy it is to draw these cuboids and cubes on isometric paper.

Exercise 2

(You will need triangular dotty paper for this exercise)

Make sure you line up the dotty paper the correct way. (see opposite)

1. Look at shape A (the cuboid) at the top of the page.
   - To draw it, start with the 3 red lines shown opposite.
   - Then complete the figure (use the green dotted lines to help).

2. Draw cuboids B, C and D using the help given below :-

   this is Chapter Fourteen
3.  
   a Copy the 3 lines shown onto triangular dotty paper.
   b Complete the figure by adding 6 more lines to show a cuboid.

4.  
   a Copy the 3 lines shown on the left onto triangular dotty paper.
   b Complete the figure by adding six more lines to show a cuboid.

5.  In question 3, your cuboid should have measured 3 boxes long by 2 boxes wide by 2 boxes high.
    What is the length, width and height of the cuboid you drew in question 4?

6.  Use your dotty paper to draw this cuboid which measures 5 boxes by 4 boxes by 3 boxes.

7.  Now use your dotty paper to draw a cuboid which is 4 boxes long, 3 boxes wide and 4 boxes high.

8.  Use dotty paper to draw a cube measuring 4 boxes by 4 boxes by 4 boxes.

9.  Miss Young drew a nice shape made up of 2 cuboids. Draw it on dotty paper and colour it in like she has.

10. Try to draw some nice 3-dimensional figures made up of cubes and cuboids. Cut out the best ones and make a display of them on the wall.
1. Name the 3-dimensional **MATHEMATICAL** shapes shown below:-

   a  b  c  d  
   e  f  g  h  

2. The two objects shown below are made up of more than one 3-D shape. List the shapes they are made up of :-

   a  b  
   

3. Which 3-dimensional figure would you get if you cut out each shape and folded it up.

   a  b  

4. Use a piece of isometric (dotty) paper to draw a **cuboid** which is 6 boxes by 2 boxes by 2 boxes.
Volume - What's that?

**VOLUME** - It is the amount of **SPACE** taken up by an object.

A bath holds more water than a kettle.  
→ The bath has a larger **VOLUME**.

**Exercise 1**

1. Which of these holds **more** liquid when full?  
   - glass for juice  
   - wine glass

2. Put these shapes in order, starting with the one which holds the **least**.  
   - dishwasher  
   - cooking-pot  
   - microwave

3. Which takes up **less** space - a football or a tennis ball?  
   - football  
   - tennis ball

4. Put these in order, starting with the one which takes up the **most** space.  
   - Van  
   - lorry  
   - motor cycle  
   - Mini
5. Ten glasses of orange juice can be poured from this carton. Six children have one glass each. How many glasses can still be poured from the carton?

6. Lucy has a bad cough. The doctor gave her some medicine. It had to be taken as follows:
   - one spoonful 3 times a day for 5 days.
How many spoonfuls will Lucy have taken by the end of the 5 days?

7. Nick has to take 2 capsules, 4 times per day for his fever.
   a. How many capsules does Nick take each day?
   b. The tub hold 24 capsules. How many days will the tub last Nick?

8. Shown is part of a recipe for making Gingerbread.
   Use the list of ingredients to answer the following questions:
   a. How much syrup is used?
   b. Which piece of cutlery is used to measure out the mixed spice?
   c. What does the recipe use less of - margarine or treacle?
   d. The amount shown above will make 10 gingerbread men. I only want to make five. How many eggs will I need to use?

9. Julie’s dad makes “cherry cocktail” in a bowl for her 10th birthday party.
   The bowl holds 20 glasses of the mixture.
   At the party Julie and her pals drink a total of 10 glasses of the juice.
   What fraction of the cherry cocktail is left after the party?
The Litre / Reading Scales

When you go shopping, many of the liquids you buy come in litres

Examples :-

1 litre of Cola
2 litres of Milk
3 litres of Ice-Cream
5 litres of Paint

Exercise 2

1. How many litres of flavoured liquid are there in each bottle?

   a. limeade
   b. strawberry
   c. grape
   d. cherry
   e. chocolate
   f. blueberry
2. Write down the volume of juice in these two cycle flasks :-

![Image of two cycle flasks with volumes marked]

3. Two beakers are filled with coloured water.
   Take a reading of how many litres of water is in each one.

![Image of two beakers with water levels marked]

4. Jane has a 1 litre carton of apple juice.
   Which of the following usually holds less than 1 litre :-
   a coffee mug     b wash-hand basin     c teaspoon
   d egg cup       e can of lemonade     f garden pond?

5. Mr Todd has a 1 litre bottle of fizzy wine.
   Which of the following usually holds more than 1 litre :-
   a wine glass       b jacuzzi
   c baby's bottle    d oil drum
   e pot for soup     f a garden pond?

6. A jug of milk holds 2 litres.
   Ben pours himself half a litre.
   How much is left in the jug?

![Image of a jug and a cup]
7. A glass for juice can hold a quarter of a litre. How many glasses can you fill from a :-
   a  1 litre bottle of cola
   b  2 litre carton of pineapple juice
   c  5 litre keg of orange
   d  10 litre barrel of cider?

8. A painter opens a two and a half litre tin of paint. He pours the paint evenly into half litre pots. How many pots will he need?

The Cubic Centimetre

Volume is the amount of space an object takes up. It is given in cubic centimetres.

This is a picture of a CUBE. Each of its edges is 1 centimetre in length. It is known as - a CUBIC CENTIMETRE.

This solid has a volume of 3 cubic centimetres.

Exercise 3

1. Count the number of cubic centimetres in each of these shapes :-

   a
   b
   c
   d
   e
   f
2. Lucy has a box of 10 bricks.
   She builds each of the following shapes.
   How many bricks out of the 10 is she left with each time?

3. Look again at question 2 and answer these questions:
   a. Which shape has the largest volume?
   b. Which shape has the smallest volume?
   c. Which shapes have the same volume and what is that volume?
   d. How many bricks would Lucy need to build ALL the solids without knocking any of them down?
   e. Lucy’s friend, Nick, only has 16 cubic centimetre bricks.
      Make a list of the PAIRS of the above shapes Nick can make.
      example - Nick can make shapes a and b from his 17 bricks.
4. Choose two yellow solids from the four shown below which can be put together to make the red solid.

a

b

c

d

5. Write down the volume of this shape, in cubic centimetres.

Weight

One of the best ways of trying to guess the weight of an object is to compare it with something else.

This litre bottle of Cola and the block of butter weigh 1 kilogram each.

If you were to hold this APPLE in your hand, - ask yourself the question ........

"does it weigh more or less than a bottle of Cola"?

If you think the apple is lighter, then it must weigh less than 1 kilogram!
Exercise 4

1. Write down which is the lighter in each pair:
   a. a mouse or a cat.
   b. a lorry or a car.
   c. a golf ball or a football.
   d. a CD or a video.

2. Write down which is the heavier in each pair:
   a. a feather or a pen.
   b. a microwave oven or a washing machine.
   c. a magazine or a sheet of paper.
   d. a brick or a pebble.

3. Put these military objects in order of weight, starting with the heaviest:
   medal  cannon  soldier  ship  tank

4. The litre bottle of Cola and the tub of butter shown in the introduction each weigh 1 kilogram (1 kg).

   What do you think these items weigh - answer more or less than 1 kg:
   a. a packet of bubble gum
   b. a colour printer
   c. a concrete slab
   d. a mobile phone
   e. a pedal bin
   f. a car battery?

5. Write down the reading on each of these bathroom scales:
   a. b.
The Kilogram and the Gram

A gram is smaller than a kilogram. A kilogram is made up of 1000 gram weights.

Examples:

1. 5 kg = 5000 g
2. 3000 g = 3 kg
3. 2350 g = 2 kg 350 g
4. 1 kg 40 g = 1040 g

Exercise 5

1. Write these weights in grams:
   a) 2 kg
   b) 7 kg
   c) 15 kg
   d) 20 kg
   e) 55 kg
   f) 3 kg 500 g
   g) 1 kg 700 g
   h) 4 kg 250 g
   i) 6 kg 610 g
   j) 3 kg 425 g
   k) 7 kg 58 g
   l) 10 kg 22 g
   m) 6 kg 80 g
   n) 9 kg 8 g
   o) 1 kg 1 g

2. The weights shown below are in grams.
   Change each of them to kilograms — or — to kilograms AND grams:
   a) 2000 g
   b) 7000 g
   c) 9000 g
   d) 16000 g
   e) 40000 g
   f) 72000 g
   g) 5600 g
   h) 6800 g
   i) 18200 g
   j) 9456 g
   k) 7240 g
   l) 2760 g
   m) 5002 g
   n) 8080 g
   o) 1015 g
3. Lucy is preparing a salad bowl for her mum’s dinner party.
The list of vegetables Lucy uses is shown below.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lettuce</td>
<td>200 g</td>
</tr>
<tr>
<td>Carrots</td>
<td>240 g</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>370 g</td>
</tr>
<tr>
<td>Spring Onion</td>
<td>140 g</td>
</tr>
<tr>
<td>Red/Green Peppers</td>
<td>215 g</td>
</tr>
<tr>
<td>Raddish</td>
<td>50 g</td>
</tr>
<tr>
<td>Red Cabbage</td>
<td>355 g</td>
</tr>
<tr>
<td>Cucumber</td>
<td>3</td>
</tr>
</tbody>
</table>

a What is the total weight of the Lettuce, the Carrots and the Tomatoes?
b What is the total weight of the Onions, the Peppers, the Raddish and the Cabbage?
c What is the total weight of all the vegetables (except the cucumbers)?
d Write the total weight of all these vegetables in kilograms and grams.
e Lucy’s mum says she puts in too much cucumber. She tells Lucy to only put in half the amount. How many cucumbers will Lucy now use in the salad?

4. Lucy also “helps” with the dessert.
She buys one and a half kilograms of strawberries to have with ice-cream.
She eats 600 grams of them herself while she is putting them into the dessert bowls!

a How many grams of strawberries did Lucy buy?
b How many grams of strawberries were left for her mum’s guests after Lucy had eaten her share?

5. Santa left two parcels - one each for Jason and his sister Danna. Jason’s parcel weighed 3 kg 300 g and Danna’s weighed 2 kg 700 g. How much lighter was Danna’s parcel?

6. Mrs Bryson bought two identical bottles of ketchup from her local store. Each bottle weighed 880 grams.

a What is the total weight of the bottles, in grams?
b What is their total weight in kilograms?
7. **Chef Ramsay** has made two cakes.
   Their total weight is 1 kg 750 g.
   The strawberry cake weighs 900 grams.
   What is the weight of the sponge cake?

8. Three identical bags of potatoes weigh a total of 3 kg 600 g.
   a What is the weight of 1 bag, in kg and g?
   b What is the weight of 1 bag, in grams?

   The Buttons can only be bought in 50 gram packets.
   a How many packets will Gemma have to buy?
   b What weight of Chocolate Buttons will she have left over?

10. Four boys went salmon fishing on a loch.
    The largest fish each of them caught is given in the table below:
    
    | Name  | Weight         |
    |-------|----------------|
    | Alan  | 1 kg 150 g     |
    | Colin | 1 kg 400 g     |
    | Omar  | 980 g          |
    | Robert| 1 kg 5 g       |
    
    a Write down the names of the boys in order, starting with the one who caught the biggest fish.
    b How many grams did Robert’s salmon weigh?
    c What was the difference in weight between the largest and the smallest fish?
    d The local hotel keeper offers to buy any fish caught fresh in the loch that day, as long as that the fish weigh at least 1100 grams.
    Which boys were not able to sell their salmon to the hotel?
1. Put these shapes in order, starting with the one which holds the most.

Wheelie Bin  Bin Lorry  Skip

2. Twelve cups of coffee can be poured from this pot.
   Nine children have one cup each.
   a  How many cups can still be poured from the pot?
   b  What fraction of the coffee still remains in the pot?

3. How many litres of juice are there in each bottle?
   a
   b

4. Ben buys a 5 litre bottle of water.
   He pours half a litre of the water into a kettle.
   How much water is left in the bottle?
5. How many cubic centimetres are there in each of these three shapes: -
   a
   b
   c

6. Write down which is the heavier in each pair: -
   a  boots or slippers.
   b  a cake of soap or a rubber duck.
   c  a bicycle or a motor bike.

7. Write down the reading on the bathroom scales.

8. Write these weights in grams: -
   a  9 kg  b  72 kg  c  1 kg 500 g  d  6 kg 30 g

9. Write these weights in kilograms or kilograms and grams: -
   a  3000 g  b  1750 g  c  2020 g  d  9005 g

10. Sisters Bobbie and Bunnie were handed a parcel each by aunt Mary for their birthday.
    Bobbie’s parcel weighed 2 kg 900 g, but
    Bunnie’s parcel was 400 grams heavier.
    How heavy was Bunnie’s parcel?
1. Write the following numbers in words :-
   a) 5470  
   b) 8026  
   c) 9003  
   d) 7989.

2. Write the following using figures :-
   a) four thousand three hundred and seventy two
   b) six thousand five hundred and four
   c) eight thousand and forty.

3. Put the following numbers in order starting with the largest :-
   3010, 2998, 2899, 3002, 2987, 3101, 2098.

4. What does the 5 stand for in each of the following :-
   a) 4052  
   b) 6571  
   c) 5203  
   d) 8815

5. a) What is the number that is 100 up from 4260 ? 
   b) What number is 300 down from 4450 ?

6. Copy and complete this fraction statement, using the diagram to help.

\[
\frac{1}{3} = \frac{?}{6}
\]

7. Find the missing values here :-
   a) \( \frac{3}{5} = \frac{?}{10} \)  
   b) \( \frac{12}{16} = \frac{3}{?} \)  
   c) \( \frac{8}{12} = \frac{2}{?} \).

8. Lucy used a calculator to work out how much MONEY she owed. It showed 11.6 on the display. How much money did Lucy owe ?

9. Write the following in pounds using the £ symbol :-
   a) 3 pounds and 27 pence.  
   b) 9 pounds and 4 pence.
10. a I bought a C.D. for £7.75 and a magazine for 83p.
How much change did I receive from a £10 note?

  b If my change was all in coins, what is the fewest number of coins I could receive?
(List the coins).

11. Do the following mentally (just write down your answers):-

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>6 + 6</td>
<td>47 + 6</td>
<td>89 + 7</td>
<td>128 + 8</td>
<td></td>
</tr>
<tr>
<td>360 + 30</td>
<td>90 + 520</td>
<td>35 - 7</td>
<td>72 - 8</td>
<td></td>
</tr>
<tr>
<td>150 - 3</td>
<td>540 - 30</td>
<td>610 - 60</td>
<td>800 - 40</td>
<td></td>
</tr>
</tbody>
</table>

12. Copy down the following and find:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>407</td>
<td>621</td>
<td>800</td>
<td>821 - 65</td>
<td></td>
</tr>
<tr>
<td>+ 54</td>
<td>- 60</td>
<td>- 58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Find the following: (you must know your tables by now).

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>5 x 6</td>
<td>3 x 7</td>
<td>8 x 6</td>
<td>4 x 9</td>
<td></td>
</tr>
<tr>
<td>7 x 7</td>
<td>8 x 7</td>
<td>7 x 9</td>
<td>7 x 6</td>
<td></td>
</tr>
<tr>
<td>5 x 7</td>
<td>9 x 8</td>
<td>6 x 9</td>
<td>10 x 8</td>
<td></td>
</tr>
</tbody>
</table>

14. Do the following mentally (just write down your answers):-

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>10 x 9</td>
<td>7 x 10</td>
<td>19 x 10</td>
<td>10 x 61</td>
<td></td>
</tr>
<tr>
<td>140 ÷ 10</td>
<td>10 x 521</td>
<td>700 ÷ 10</td>
<td>10 x 819</td>
<td></td>
</tr>
</tbody>
</table>

15. Copy down the following and find:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>29</td>
<td>82</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>x 6</td>
<td>x 5</td>
<td>x 8</td>
<td>x 7</td>
<td></td>
</tr>
</tbody>
</table>

16. Copy down the following and find:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>4√156</td>
<td>8√464</td>
<td>504 ÷ 7</td>
<td>336 ÷ 6</td>
<td></td>
</tr>
</tbody>
</table>

17. Round the following numbers to the nearest 10:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>73</td>
<td>277</td>
<td>133</td>
<td>35</td>
</tr>
</tbody>
</table>
18. Find an approximate answer the following by ROUNдинG the 518 and 78 :-

“518 + 78”
is about 520 + ....
= .................

19. Find :-
   a \( \frac{1}{2} \) of 62       b \( \frac{1}{3} \) of 27       c \( \frac{1}{5} \) of 85       d \( \frac{1}{10} \) of 410.

20. Write down the next 3 numbers in each of the following patterns :-
   a 4, 8, 12, 16, ...
   b 10, 20, 30, 40, ...
   c 56, 48, 40, 32 ...
   d 5, 8, 11, 14, ...
   e 11, 17, 23, 29, ...
   f 50, 47, 44, 41, ...

21. Calculate the values of the “?“s in these number machines :-

   a \begin{array}{c}
       \text{IN} \\
       5
   \end{array}
   \begin{array}{c}
       \times 4 \\
       ?
   \end{array}
   \begin{array}{c}
       \text{OUT}
   \end{array}

   b \begin{array}{c}
       \text{IN} \\
       40
   \end{array}
   \begin{array}{c}
       \text{quartered} \\
       ?
   \end{array}
   \begin{array}{c}
       \text{OUT}
   \end{array}

   c \begin{array}{c}
       \text{IN} \\
       ?
   \end{array}
   \begin{array}{c}
       + 5 \\
       7
   \end{array}
   \begin{array}{c}
       \text{OUT}
   \end{array}

   d \begin{array}{c}
       \text{IN} \\
       25
   \end{array}
   \begin{array}{c}
       ?
   \end{array}
   \begin{array}{c}
       \text{OUT} \\
       18
   \end{array}

22. How many grams are in :-
    a 2 kg       b 5 kg       c \( \frac{1}{2} \) kg       d 2\( \frac{1}{4} \) kg

23. Estimate the volume of liquid in this jug (in litres).

24. Write down the areas of these 2 shapes (in cm\(^2\)).

   a
   b
25. The width of the classroom door is about :-
   1 m, 2 m, 4 m, 10 m, 20 m — Which one?

26. What is a good estimate for the length of this line?
   [Diagram of a line with measurements 1 cm, 3 cm, 5 cm, 10 cm]

27. To what numbers are these arrows below pointing?
   [Diagrams of a and b with numbers 4, 6, 8; and c and d with numbers 120, 130, 140, 300, 400, 500]

28. 3:40 pm means 20 to 4 in the afternoon.
    Write the following times in a similar way :-
    a  7:55 am        b  3:50 pm        c  12:35 am.

29. How long is it from :-
    a  8 am till 11 am       b  7:15 pm till 7:55 pm
    c  10 to 6 till 25 past 6  d  11:35 am till 12:30 pm?

30. 25th December 1988 can be written as 25.12.88.
    Write down the following in the same way :-

31. a  Jane’s birthday is on the 24th July.
      Ravi’s birthday is 12 days later.
      On what date is Ravi’s birthday?
      b  Ben’s birthday is on the 5th December.
      He went to a Safari Park 1 week before his birthday.
      On what date did he visit the park?
32. Name the following mathematical shapes :-

   a   b   c

   d   e   f

33. Name the red shape in each of the following :-

   a   b   c   d

34. Use a pair of compasses to draw a full size circle which has a radius of 6 cm.

35. Lucy arranges to meet Jane in the cafe. Afterwards, they plan to go to the cinema. Describe clearly what directions they would take to get to from the cafe to the cinema.

   (use comments like take the 2nd on the left into ....Street)
36. Make a neat copy of these shapes. Mark, in colour or as a dotted line, the lines of symmetry.

37. a Make an accurate drawing of the following 2 shapes on squared paper.

b Complete each figure by drawing the missing half of each shape so that the red line is a line of symmetry.

38. This diagram shows a RIGHT ANGLE. How many degrees are there in a right angle?

39. State the special name used to describe the following angles:

40. Calculate the size of the blue shaded angle in this figure.
41. A group of children were asked to name their favourite flower.

<table>
<thead>
<tr>
<th>Flower</th>
<th>Tally Marks</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>pansy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daffodil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pansy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>buttercup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daisy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pansy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>buttercup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daisy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daffodil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daffodil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pansy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daffodil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Copy the tally table and use tally marks to fill in the 2nd column.
b Complete your table by filling in the 3rd column.

42. The database shows the results of a survey of the name, age, brothers/sisters and weight of seven children.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Brothers</th>
<th>Sisters</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom</td>
<td>12</td>
<td>1</td>
<td></td>
<td>46 kg</td>
</tr>
<tr>
<td>Lynn</td>
<td>14</td>
<td>2</td>
<td></td>
<td>36 kg</td>
</tr>
<tr>
<td>Joan</td>
<td>11</td>
<td>2</td>
<td></td>
<td>34 kg</td>
</tr>
<tr>
<td>Steve</td>
<td>12</td>
<td>1</td>
<td></td>
<td>48 kg</td>
</tr>
<tr>
<td>Bill</td>
<td>14</td>
<td>2</td>
<td></td>
<td>51 kg</td>
</tr>
<tr>
<td>Alan</td>
<td>13</td>
<td>3</td>
<td></td>
<td>46 kg</td>
</tr>
<tr>
<td>Brian</td>
<td>10</td>
<td>0</td>
<td></td>
<td>36 kg</td>
</tr>
</tbody>
</table>

a One boy has 3 sisters. Which boy?
b How many children weighed over 45 kilograms?
c How old was the girl who weighed 36 kilograms?
d Describe Joan in words using the table to help you?

43. Children were asked to name their favourite ice cream flavours.

<table>
<thead>
<tr>
<th>Flavour</th>
<th>Vanilla</th>
<th>Mint</th>
<th>Chocolate</th>
<th>Strawberry</th>
<th>Banana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>14</td>
<td>18</td>
<td>16</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

Use a ruler to draw a (VERY NEAT) bar graph using the given scale and label your diagram.
Answers to Book C
Answers to Chapter 0

1. a ninety six
   b one hundred and twenty three
   c four hundred and fifty nine
   d nine hundred and five
2. a 62 b 715 c 590 d 804
3. a 147 b 279 c 677 d 620 e 190 f 995
4. a 390, 302, 211, 199, 96, 89
   b 817, 807, 803, 800, 799, 798, 789, 779
5. see drawings
6. see drawings
7. a 2 b 4
8. a 67p b 50p, 10p, 5p, 2p
9. a 5 b 12 c 20
10. a 10 b 38 c 70 d 170 e 51 f 13 g 100 h 210
11. a 95 b 82 c 54 d 7 e 60 f 8 g 7 h 7
12. a 14 b 40 c 20 d 27 e 60 f 8 g 7 h 7
13. a 153 b 170 c 610 d 14 e 46 f 17 g 252 h 18
14. a 21p b 45g
15. a £99 b 45g
16. a 60 b 80 c 40 d 20
17. a 40 b 70
18. a £13 b 34g c £4 d 10 kg
19. 66, 62, 130, 6, 402
20. a 15, 18, 21 b 25, 30, 35 c 40, 30, 20 d 53, 63, 73 e 14, 17, 20 f 33, 22, 11
21. a
22. a 7 b 8 c 7 d 5 e 17 f 24
23. a x b + c – d +
24. a = 18, b = 21, c = 66, d = 79
25. 85 cm, 90 cm, 105 cm, 1 m 6 cm, 1 m 83 cm
26. a 325 cm b 256 cm c 108 cm d 4 m 30 cm e 2 m 7 cm
27. a half past 8 (8:30) b quarter to 2 (1:45)
28. a quarter past six b quarter to twelve
29. June 17th, June 30th, July 23rd, August 1st
30. January, March, June, August, December
31. a square b rectangle c circle d triangle
32. a cube b cuboid c cone d cylinder e sphere f triangular prism g pyramid
33. a 6 b 12 c 8
34. a faces = 5, edges = 9, corners = 6
   b faces = 5, edges = 8, corners = 5
35. a yes b yes c no d yes e no f yes
36. a cup/saucer b salt and pepper
37. see drawing
38. a Frank b Drac
39. only “c”
40. a yes b yes c no d yes e yes f no
41. a Tommy and John b Green c 2
42. a brown b 8 c 3

Answers to Chapter 1

Exercise 1

1. a tens b thousand c units d hundred
2. a thousand b tens c units d hundreds
3. a five hundred and sixty two
   b seven hundred and eight
   c nine thousand three hundred and seventeen
   d eight thousand eight hundred and twenty seven
   e ninety eight
   f five thousand and thirty
   g eight thousand and six
   h nine thousand one hundred and three
4. a 850 b 705 c 7800 d 6204 e 5063 f 9014 g 1234
5. a 215 b three hundred and eight
6. a 237, 270, 289, 299, 300, 304, 310, 317 b 5045, 5897, 5989, 6001, 6054, 6099, 6104, 6200 c 791, 989, 991, 999, 1002, 1009, 1090, 1099, 1900, 1910
7. a 360 b 690 c 4300 d 1430 e 1670 f 6100 g 2000 h 2700 i 3200 j 670 k 9200 l 5400
8. a 1988 b 1929
9. a = 14, b = 96, c = 101, d = 26, e = 38, f = 430 g = 520, h = 120, i = 210, j = 350, k = 425
10. a 6 b 18 c 28 d 24 e 250 f 80
11. a 16°C b 7°C c 44°C d 170°C e 3°C f 125°C
12. a 700m b 1700m c 1250m

Exercise 2

1. a 61 b 68 c 31 d 23 e 45 f 74 g 550 h 540 i 250 j 410 k 713 l 430 m 50 n 65 o 530 p 660
2. a 47 b 56 c 34 d 61 e 81 f 72 g 200 h 340 i 440 j 610 k 310 l 810 m 240 n 460 o 300 p 680
3. a 64 b 51 c 39 d 66 e 78 f 39 g 58 h 87 i 9 j 243 k 311 l 390 m 190 n 560 o 740 p 890

Chapter 1

Exercise 2

1. a 61 b 68 c 31 d 23 e 45 f 74 g 550 h 540 i 250 j 410 k 713 l 430 m 50 n 65 o 530 p 660
2. a 47 b 56 c 34 d 61 e 81 f 72 g 200 h 340 i 440 j 610 k 310 l 810 m 240 n 460 o 300 p 680
3. a 64 b 51 c 39 d 66 e 78 f 39 g 58 h 87 i 9 j 243 k 311 l 390 m 190 n 560 o 740 p 890
Answers to Chapter 2

Exercise 1

1. a yes  b yes  c yes  
   d no    e yes  f yes

2.  

Exercise 2

Chapter 2

Exercise 2

1. a  

2. a  

Answers Level C

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**Answers to Chapter 3**

**Exercise 1**

1. a 2 b 10 c 17 d 26 e 62 f 80 g 105 h 92 i 150

2. a 2 b 5 c 6 d 11 e 14 f 31

3. a 2 b 3 c 7 d 8 e 16 f 22

4. a 36p b 59p c £1

5. a 5p and 1p b 20p and 2p c 20p and 10p d 50p and 20p e £1, 10p and 1p f 100

6. a 3 b 5 c 8 d 9

7. a 100 b 500 c 800 d 700

8. a £1 and 40p b £2 and 47p c £3 and 64p d £1 and 7p e £9 and 99p f £2 and 5p g £0 and 36p h £0 and 2p

**Exercise 2**

1. a £6·13 b £4·62 c £5·78 d £3·02 e £0·29 f £0·03

2. a £0·68 b £0·99 c £0·90 d £1·28 e £1·74 f £1·63 g £2·80 h £10·00 i £10·30 j £8·68 k £5·00 l £10·20 m £11·11 n £13·40 o £13·38 p £13·30 q £17·00 r £12·01 s £15·30 t £8·77 u £11·97 v £87p

3. a £0·20 b £0·60 c £0·50 d £0·35 e £0·55 f £1·15 g £4·30 h £4·30 i £7·00 j £1·02 k £1·45 l £4·15 m £5·47 n £3·76 o £0·90

4. 87p 5. 13p 6. 13p 7. a £1·10 b 40p 8. a £1·90 b 10p 9. a £6·70 b 30p 10. a 70p b £4·30 11. a £2·70 b No - 20p short 12. a £2·12 b £2, 10p, 2p

**Exercise 3**

1. a 4 o’clock b 7 o’clock c half past 2 d half past 11 e quarter past 1 f quarter to 8 g quarter past 6 h quarter to 4

2. a 20 past 6 b 10 past 1 c 25 past 8 d 20 to 9 e 10 to 3 f 25 to 2 g 5 past 10 h 5 to 6

3. a 7·25 or 25 past 7 b 9·45 or quarter to 10 c 2·35 or 25 to 3 d 6·50 or 10 to 7 e 10·20 or 20 past 10 f 8·10 or 10 past 8 g 10·15 or quarter past 10 h 11·35 or 25 to 12

**Answers to Chapter 4**

**Exercise 1**

1. a 4 o’clock b 7 o’clock c half past 2 d half past 11 e quarter past 1 f quarter to 8 g quarter past 6 h quarter to 4

2. a 20 past 6 b 10 past 1 c 25 past 8 d 20 to 9 e 10 to 3 f 25 to 2 g 5 past 10 h 5 to 6

3. a 7·25 or 25 past 7 b 9·45 or quarter to 10 c 2·35 or 25 to 3 d 6·50 or 10 to 7 e 10·20 or 20 past 10 f 8·10 or 10 past 8 g 10·15 or quarter past 10 h 11·35 or 25 to 12

**Exercise 2**

1. a 2·30 or 1/2 past 2 b 3·45 or 1/4 to 4 c 6·15 or 1/4 past 6 d 8·50 or 10 to 9 e 7·20 or 20 past 7 f 9·40 or 20 to 10 g 12·55 or 5 to 1 h 1·35 or 25 to 2

2. a 5·15 b 9·30 c 3·45 d 7·10 e 9·25 f 9·40 g 2·55 h 3·35 i 5·45 j 7·40 k 5·55 l 7·30

3. a 10 past 5 or 5:10 b 25 to 4 or 3:35 c 10 to 2 or 1:50 d 20 past 9 or 9:20

**Exercise 3**

1. a 8 o’clock in the morning or 8:00 am b 1/2 past eleven in the morning or 11:30 am c 1/4 past 9 at night or 9:15 pm d 1/4 to eight in the morning or 7:45 am e Ten to 7 at night or 6:50 pm f 5 to eight in the morning or 10:55 am g 25 to eleven at night or 10:35 pm h 1/2 past 3 in the afternoon or 3:30 pm i 10 to 11 in the morning or 10:50 am j 20 past 6 in the morning or 6:20 am k 5 past 7 at night or 7:05 pm l midnight or 12:00 am

2. a 8:15 pm b 10:45 am and 11:30 am c 7:25 pm and 8:40 pm d 12:50 pm e 6:50 pm and 7:55 am f 3:40 pm and 5:25 pm

**Answers Level C**

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3. a 1/2 past 2 in the afternoon  
   b 1/4 to 10 in the morning  
   c 10 to 11 at night  
   d 10 past 6 in the morning  
   e 1/2 past 11 in the morning  
   f 10 to 6 at night  
   g 25 to 11 in the morning  
   h 25 to 6 in the morning  
   i 8 minutes to 8 at night  
   j 25 past 10 at night  
   k 5 to 12 in the morning  
   l 12 o’clock at noon  

4. Penmure – 25 past 11 in the morning  
   Overton – 1 minute to 12 in the morning  
   Dunure – 20 past 12 in the afternoon  
   Helsby – 5 past 1 in the afternoon  

5. check copy  
   a 5 to 10 in the morning  
   b 5 past 11 in the morning  
   c 1:35 pm  
   d 10 past 2 in the afternoon  
   e 2:55 pm  

6. 5 minutes late  

7. Palma – 20 to 12 in the morning  
   Barcelona – 25 to 1 in the afternoon  
   Ibiza – 5 past 1 in the afternoon  
   Tenerife – 10 to 3 in the afternoon  
   Nice – 20 past 3 in the afternoon  

8. 8:55 am —> 9:55 am —> 10:20 am —> 11:45 am —> 12:00 noon —> 12:35 pm —> 12:50 pm —> 12:55 pm  

9. a afternoon  
   b (i) 10 to 4 in the afternoon  
   (ii) 25 past 5 at night  
   (iii) 25 to 8 at night  
   (iv) 10 to 9 at night  
   c Count–up  
   d (i) Neighbours At Home  
   (ii) Sports Roundup  
   (iii) Big Sister  

Chapter 4  

Exercise 4  

1. a 15 b 20 c 30 d 25  
   e 40 f 35 g 35 h 25  

2. 45 minutes  

3. a 20 b 35 c 40  
   d 12 e 13 f 46  

4. 40 minutes  

5. 45 minutes  

6. 45 minutes  

7. a 25 mins b 15 mins c 40 mins  
   d 45 mins e 35 mins  

8. 5:35 pm  

9. a 3:55 pm b 2:50 am c 9:30 am d 6:25 pm  
   e 8:15 am f 6:20 pm g 7:55 am h 11:30 am  

10. a Barhead  
    b (i) 12 mins (ii) 20 mins (iii) 18 mins  
    c (i) 24 mins (ii) 38 mins (iii) 56 mins  

11. yes - by 5 minutes  

Answers Level C  

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Chapter 5

Exercise 4
1. a 27 b 94 c 162 d 80
   e 30 f 508 g 720 h 606
   i 500 j 800 k 100 l 101
2. a 64 b 72 c 190 d 420
   e 608 f 560 g 176 h 100
3. a 58 b 71 c 95 d 76
   e 90 f 408 g 600 h 905
4. a 4 cm b 9 cm c 16 cm
   d 40 cm e 72 cm
5. a 18 b 64 c 30
   d 700 ml e 32
6. £1000
7. 4 gallons
8. a 200 b 20 c 100

Chapter 5

Exercise 5
1. 43 lies between 40 and 50
   43 is closer to 40 than 50
   43 rounds to 40 (to the nearest 10)
2. 167 lies between 160 and 170
   167 is closer to 170 than 160
   167 rounds to 170 (to the nearest 10)
3. 62 lies between 60 and 70
   62 is closer to 60 than 70
   62 rounds to 60 (to the nearest 10)
4. a between 80 and 90 — 90
   b between 120 and 130 — 120
   c between 250 and 260 — 260
   d between 600 and 610 — 610
5. a 50 b 80 c 20 d 80
   e 150 f 180 g 220 h 420
   i 70 j 200 k 200 l 890
6. a 140 b 430 miles c 200 cm
   d 150 pounds e 480 dollars

Chapter 5

Exercise 6
1. a 58 + 77 b 94 + 86 c 36 + 68 d 137 + 264
   60 + 80 90 + 90 40 + 70 140 + 260
   = 140 = 180 = 110 = 400
   e 131 – 88 f 197 – 133 g 262 – 188 h 493 – 416
   i 130 – 90 j 200 – 130 k 260 – 190 l 490 – 420
   = 40 = 70 = 70 = 70
   = 860 = 60 = 1080 = 400
2. a 80 b 160 c 90 d 220
   e 20 f 120 g 160 h 200
3. 550 stamps

Chapter 5

Exercise 7
1. £33
2. £4995
3. 314 people
4. £3904
5. 2150 kg
6. 338 cm
7. 32 ml
8. 1855 m
9. 60 trays
10. 240 m
11. £10925
12. £2645
13. 4380 days
14. a 3120g b 260g
15. a 84 mins b 360 mins c 4380 mins
16. 10 800 ml
17. a 44640 mins b 43200 mins
   c 132480 mins

Answers to Chapter 6

Exercise 1
1. a 7 b 6 c 5 d 24
2. a 11 b 11
   c 1111 d 1111
   e 11111 f 11111
   g 1111111
3. a Cola — 4
   b Orange — 5
   c Water — 3
   d Im Bru — 10
   e Lemon — 6
   f 5 g Im Bru d 6 e 28
4. a P1 — 1
   b P2 — 3
   c P3 — 0
   d P4 — 5
   e P5 — 10
   f P6 — 2
   g P7 — 3
   h P8 — 10
   i P9 — 2
   j P10 — 3
   j P11 — 3
   k P12 — 3
   l P13 — 3
   m P14 — 3
   n P15 — 3
   o P16 — 3
   p P17 — 3
   q P18 — 3
   r P19 — 3
   s P20 — 3
   t P21 — 3
   u P22 — 3
   v P23 — 3
   w P24 — 3
   x P25 — 3
   y P26 — 3
   z P27 — 3

Exercise 2
1. a 7 b 6 c 5 d 24
2. a 11 b 11
   c 1111 d 1111
   e 11111 f 11111
   g 1111111
3. a Cola — 4
   b Orange — 5
   c Water — 3
   d Im Bru — 10
   e Lemon — 6
   f 5 g Im Bru d 6 e 28
4. a P1 — 1
   b P2 — 3
   c P3 — 0
   d P4 — 5
   e P5 — 10
   f P6 — 2
   g P7 — 3
   h P8 — 10
   i P9 — 2
   j P10 — 3
   j P11 — 3
   k P12 — 3
   l P13 — 3
   m P14 — 3
   n P15 — 3
   o P16 — 3
   p P17 — 3
   q P18 — 3
   r P19 — 3
   s P20 — 3
   t P21 — 3
   u P22 — 3
   v P23 — 3
   w P24 — 3
   x P25 — 3
   y P26 — 3
   z P27 — 3

Answers Level C

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7. a. 7 — 2  
   8 — 5  
   9 — 6  
   10 — 11  
   11 — 9  
   12 — 3  
8. various – check

Chapter 6

Exercise 2
1. a. (i) 5  (ii) 0  (iii) 3  b. 23
2. a. 8  b. 4  c. 9
   d. 5  e. 1
3. a. Aug — 8  
    Sep — 16  
    Oct — 7  
    Nov — 10  
    Dec — 1
   b. December  c. 42
4. a. 4
   b. HJ — 10  
    LJ — 7  
    100m — 20  
    200m — 18  
    800m — 11
   c. 17  d. 66
5. check pictograph (with key)

Chapter 6

Exercise 3
1. a. 15  b. 9  c. 22  d. 62
2. a. mice — 17  
    snake — 2  
    cat — 14  
    fish — 21  
    dog — 16
   b. 70
3. a. 8
   b. Lemon — 8  
    Irn Bru — 42  
    Cola — 28  
    Water — 14  
    Orange — 18
   c. 24  d. 110
4. a. (i) 8  (ii) 2  (iii) 9  (iv) 11
   b. 6  c. 36
5. a. 100m — 12  
    200m — 10  
    800m — 6  
    LJ — 9  
    HJ — 3
   b. 40
6. a. Blue — 16  
    Red — 20  
    Green — 12  
    Black — 28  
    Purple — 6
   b. 82
7. see bar graph
8. see bar graph

Answers to Chapter 7

Exercise 1
1. a. 8  b. 24
2. a. 9  b. 24
3. a. 11  b. 8  c. 24  d. 4
   e. 21  f. 7  g. 35  h. 5
   i. 37  j. 57
4. a. 6  b. 17  c. 55
   d. 120  e. 1000
5. a. 4  b. 5  c. 10  d. 48
6. a. 21
   b. (i) 13  (ii) 27  (iii) 0  (iv) 62
   c. (i) 12  (ii) 4  (iii) 15  (iv) 99
7. a. 1  b. 9  c. 3  d. 5
   e. 1  f. -2  g. +12  h. -17
9. a. 1 — 9p  
    2 — 18p  
    3 — 27p  
    4 — 36p  
    5 — 45p  
    6 — 54p
   b. times 9  c. 108p
10. a. 1 2 3 4 5 6
    4 8 12 16 20 24
   b. x. 4  c. 120
11. a. Cakes  Cost
    1. £2.50
    2. £5.00
    3. £7.50
    4. £10.00
   b. (i) £10  (ii) £25

Answers Level C  

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Chapter 7

Exercise 2
1. a 15  b 23  c 5  
   d 27  e 3
2. a 11  b 26  c 36  
   d 101  e 1
3. a 24  b 9  c 4  
   d 0  e 24  f 1
4. a 22  
   b (i) 16  (ii) 17  (iii) 5  (iv) 31  
   c (i) 10  (ii) 5  
   d 4 (*Difficult)

Chapter 7

Exercise 3
1. a 3y  b 3p  c 3t  d 3t
2. a 5x  b 5y  c 5k
3. a 6a  b 2x  c 8y  d 15k  
   e x + 3  f y – 5

Answers to Chapter 8

Exercise 1
1. a A, B, D, G, I, J  
   b Sketches for semicircle, square, hexagon, kite, triangle, rectangle  
   c cube, cone, sphere, pyramid, triangular prism  
   d L
2. a pentagon  b 5  c 5
3. a 4, 4  b 3, 3  c 8, 8  d 6, 6
4. a 6  b rectangle  c square
5. a square  b triangle
6. a triangular prism  b triangle  c rectangle
7. a circle  b square  c semi-circle  
   d triangle, rectangle  e rectangle
8. See drawings

Chapter 8

Exercise 2
1. See drawings
2. See drawings
3. See drawings
4. See drawings
5. See drawings
6. See drawings
7. See drawings
8. See drawings
9. See drawings (various)
10. a yes  b yes  c yes  d yes  
    e no  f yes  g yes  h no  
    i yes  j no  k yes  l no

Chapter 8

Exercise 3
1. List e.g. coins pizza tyre polo mint pot tin can mirror ............
2. a Drawing  b Drawing with diameter  
   c 2p = 25 mm  10p = 24 mm
3. a See drawings  b colour  
    c 2p = 150 mm and 25 mm  10p = 144mm and 24 mm
4. See drawing
5. See drawing
6. See drawing
7. See drawing
8. See drawing
9. See drawing
10. See drawing
11/12. See drawing

Chapter 8

Exercise 4
1. a Drawing  b draw radius  c colour
2. drawing
3/4/5/6/7/8. See drawings

Answers to Chapter 9

Exercise 1
1. a yes  b yes  c no  
   d no  e yes  f yes
2. a 9  b 8
3. 1 - smaller  2 - smaller  3 - bigger  4 - bigger  
   5 - smaller  6 - bigger  7 - bigger  8 - bigger  
   9 - smaller  10 - smaller  11 - bigger  12 - Right  
   13 - Right
4. a none  b 2, 3 & 4  c 1 & 5
5. loads !!! (83)
6. 

Chapter 8

Exercise 2
1. a 90°  b 180°  c 360°
2. a 90°  b 180°  c 90°  
   d 180°  e 270°  f 360°
3. a 90°  b 180°  c 90°
   d 270°  e 90°  f 270°
   g 360°  h 270°  i 30°

Chapter 9

Exercise 2
1. a R  b A  c O  
   d A  e S  f O  
   g R  h A  i O
2. a O  b R  c O  
   d A  e O  f R

Answers Level C  page 188
Answers to Chapter 10

Exercise 1

1. \( \frac{1}{4} \)
2. \( \frac{1}{3} \)
3. a \( \frac{1}{5} \) b \( \frac{1}{6} \) c \( \frac{1}{10} \) d \( \frac{1}{8} \)
4. 3 parts red \( \frac{3}{4} \)
5. a Pentagon b \( \frac{5}{6} \) c \( \frac{3}{5} \) d \( \frac{3}{5} \)
6. a \( \frac{2}{3} \) b \( \frac{2}{5} \) c \( \frac{4}{7} \) d \( \frac{3}{8} \)
7. e \( \frac{5}{6} \) f \( \frac{4}{9} \) g \( \frac{4}{5} \) h \( \frac{4}{7} \)
8. a Drawing \( \frac{3}{5} \) b \( \frac{1}{3} \) c \( \frac{5}{8} \) d \( \frac{1}{6} \) e \( \frac{5}{9} \) f \( \frac{1}{5} \) g \( \frac{3}{7} \)

Exercise 2

1. a \( \frac{1}{2} \) b \( \frac{3}{4} \) c \( \frac{2}{3} \) d \( \frac{4}{6} \)
2. \( \frac{3}{4} = \frac{6}{8} \)
3. a \( \frac{4}{6} = \frac{2}{3} \) b \( \frac{6}{10} = \frac{3}{5} \)
4. a \( \frac{15}{18} = \frac{5}{6} \) b \( \frac{2}{6} = \frac{1}{3} \) c \( \frac{10}{16} = \frac{5}{8} \)
5. a \( \frac{2}{5} \) b \( \frac{1}{3} \) c \( \frac{1}{5} \)

Chapter 10

Exercise 3

1. a Mon, Tues, Wed, Thurs, Fri, Sat, Sun
2. a Drawing b 3 bits
c any 3 blue, any 6 yellow
d 11

Answers to Chapter 11

Exercise 1

1. a Ann b Joe c Joe
d Ted e Sam f Sid
g biking h camping i 2 below j 2nd left
2. a sausage b salami c turkey d sausage
e chicken f kebabs g turkey h chops
i 2 below j 2nd left
3. a h’copter b tram c m’bike d plane
e backie f rickshaw g taxi h pram
i ship j old car
4. a 2 to the right b 3 to the left
c 3 to the right d 4 to the left and 2 up
5. a ship b rickshaw c jeep d jeep
6. a (i) Mave (ii) Twins (iii) Alice
b (i) Alice (ii) Henry (iii) Back to Brenda
c Jake & Brian d Jake e Twins
7. a Ian b Christina c Karen
d Jim e Ian
f 1/4 turn clockwise OR 3/4 turn anticlockwise

Chapter 11

Exercise 2

1. a 2 forward, turn left, 2 forward, turn right,
b 2 forward, turn right, 2 forward, turn left, 3 forward.
c 3 forward, turn left, 1 forward, turn right,
d 1 forward, turn left, 2 forward, turn right, 3 forward.

Answers Level C page 189
2. a Come out of house, turn left into BOND Street., turn 1st LEFT into TEMPLE Road. The temple is the 3RD building on the right.
b Come out of house, turn right into BOND St., turn 1st RIGHT into JOHN St. Walk along John St. and take the 4TH road on the left. This is BANK St. The bank is the 1ST building on the LEFT.
c Out house, turn right into Bond St, along Bond St, WM is 3rd building on right.
d Out library, turn right into Read St, along Read St, take 4th right into Air Way, along Air Way, Airport is 3rd building on right.
e Out school, turn right into George St, along George St, take 2nd road on right onto Dale Rd, factory 1st building on left.
f Out Police Station, turn right into Pit Rd, along Pit Rd, take 4th on left into Farm Rd, along Farm Rd, farm is 2nd building on left. About Turn back down Farm Rd take 3rd road on right into Read St, then first left into Temple Rd, Golf Club is 1st building on left. Other Answers !

3. a Out of shops, forward 2 spaces. turn left, forward 7 spaces, turn right, forward 3 spaces.
b Out of school, turn left, forward 6 spaces. turn right, forward 2 spaces, turn left, forward 12 spaces.
c Out of station, turn right, forward 4 spaces. turn right, forward 2 spaces, turn left, forward 3 spaces. Left.
d Out of petrol station, turn left, forward 3 spaces. turn left, forward 9 spaces. turn right, forward 4 spaces. Right.

4. a Petrol Station b Fire Station c Harbour

Chapter 11

Exercise 3
1. a S b N c E d N e N
2. a 90° b 180° c 90° d 270° e 360°
3. a East 3 squares, South 3 squares, East 2 squares, North 1 square, East 2 squares
b North 2 squares, East 1 square, South 1 square, East 3 squares, North 3 squares, East 2 squares.
c West 3 squares, South 1 square, East 1 square, South 1 square, West 2 squares, South 1 square, East 4 squares.
d East 2 squares, North 2 squares, West 1 square, North 1 square, East 3 squares, South 2 squares, East 1 square, North 1 square, East 2 squares.
4. 5

6. a Marsh Island Harbour b Lighthouse Island Dock c Iceberg !

Answers Level C page 190
6. a 2 m 15 cm b 4 m 75 cm
c 7 m 9 cm d 2 m 8 cm
e 10 m 50 cm f 20 m 3 cm
7. a 545 cm b 3 m 65 cm c 2008 cm

Chapter 12
Exercise 4
1. a 99 cm, 1 m 29 cm, 1 m 34 cm, 170 cm
   b 130 cm, 127 cm, 1 m 19 cm, 1 metre 9 cm.
2. 41 cm
3. 155 cm
4. 117 cm
5. 7 m
6. a 860 cm b 140 cm

Chapter 12
Exercise 5
1. 12 cm²
2. a 3 cm² b 6 cm² c 9 cm²
d 9 cm² e 5 cm² f 10 cm²
g 4 cm² h 8 cm² i 12 cm²
3. a 3.5 cm² b 7.5 cm² c 12 cm²
d 9 cm² e 12 cm²
4. a 10 cm² b 13 cm²

Chapter 12
Exercise 6
1. a 10 cm² b 15 cm²
2. a 5 cm² b 12 cm² c 36 cm² d 28 cm²
3. a 11 cm² b 30 cm²
4. a 24 cm² b 8 cm² c 16 cm²

Answers to Chapter 13
Exercise 1
1. a K b P c M d Q
e U f X g R h Y
i IJ j IJK
5. a Sugar lump, oxo cube, dice ............
b Shoe box, Lunch box, Microwave ............
c tin soup, cola can, drum cheese.............
d football, gob-stopper, marble ..............
e clowns hat, motorway, cone, witches hat .........

Chapter 14
Exercise 2
See drawings

Answers to Chapter 15
Exercise 1
1. Juice Glass
2. cooking pot microwave dish-washer
3. tennis ball
4. Lorry Van Mini Motor Cycle
5. 4
6. 15
7. a 8 b 3 days
8. a 2 oz b teaspoon c margarine d 1 egg
9. 1/2

Chapter 15
Exercise 2
1. a 2 L b 3 L c 1·5 L
d 3 L e 1/2 L f 1/3 L
2. a 1/2 L b 1·5 L
3. a 3·5 L b 6 L
4. coffee mug teaspoon egg cup can of lemonade
5. jacuzzi oil drum pot for soup garden pond
6. 1·5 L
7. a 4 b 8 c 20 d 40
8. 5 pots

Chapter 15
Exercise 3
1. a 4 b 4 c 6
d 11 e 6 f 10
g 21 h 21 i 15
2. a 3 b 2 c 1
d 2 e 0 f 1
3. a Shape e b Shape a
c Shape b = d = 8 and Shape c = f = 9
d 51 cubic cm
3 a & b, a & c, a & d, a & f, b & d

Chapter 15
Exercise 4
1. a mouse b car c golf ball d CD
2. a pen b washing machine
c magazine d brick
3. ship, tank, cannon, soldier, medal
4. a less b more c more
d less e less f more
5. a 53 kg b 53·5 kg

Chapter 15
Exercise 5
1. a 2000 g b 7000 g c 15 000 g
d 20 000 g e 55 000 g f 3500 g
g 1700 g h 4250 g i 6610 g
j 3425 g k 7058 g l 10 022 g
m 6080 g n 9008 g o 1001 g
2. a 2 kg b 7 kg c 9 kg
d 16 kg e 40 kg f 72 kg
g 5 kg 600 g h 6 kg 800 g i 18 kg 200 g
j 9 kg 450 g k 7 kg 240 g l 2 kg 760 g
m 5 kg 2 g n 8 kg 80 g o 1 kg 15 g
3. a 810 g b 760 g c 1570 g d 1 kg 570 g
e 1·5 cucumbers
4. a 1500 g b 900 g
5. 600 g
6. a 1760 g b 1·76 kg
7. 850 g
8. a 1 kg 200 g b 1200 g
9. a 7 b 10 g
10. a Colin, Alan, Robert, Omar
b 1005 g c 420 g d Robert & Omar

Answers to Chapter 16
Revision Exercise
1. a five thousand four hundred and seventy
   b eight thousand and twenty six
   c nine thousand and three
d seven thousand nine hundred and eighty nine
2. a 4372 b 6504 c 8040
3. 3101, 3010, 3002, 2998, 2987, 2899, 2098.
4. a 50 b 500 c 5000 d units
5. a 4360 b 4150
6. 1/3 = ²/₆
7. a 6 b 4 c 3
8. £11·60
9. a £3·27 b £9·04
10. a £1·42 b 4 ( £1, 2 x 20p, 2p)
11. a 12 b 53 c 96 d 136
e 390 f 610 g 28 h 64
i 147 j 510 k 550 l 760
12. a 461 b 561 c 742 d 756
13. a 30 b 21 c 48 d 36
e 49 f 56 g 63 h 42
i 35 j 72 k 54 l 80
14. a 90 b 70 c 190 d 610
e 14 f 5210 g 70 h 8190
15. a 144 b 145 c 656 d 343
16. a 44 b 58 c 72 d 56
17. a 70 b 280 c 130 d 40
18. 600
19. a 31 b 9 c 17 d 41
20. a 20 24 28 b 50 60 70
c 24 16 8 d 17 20 23
e 35 41 47 f 38 35 32
21. a 20 b 10 c 2 d 7
22. a 2000 g b 5000 g c 500 g d 2250 g

Answers Level C
23. 3.5 Litres
24. a 12 cm²  b 10 cm²
25. 1 metre
26. 5 cm
27. a 5  b 78  c 145  d 440
28. a 5 to 8 in morning  
   b 10 to 4 in the afternoon  
   c 25 to 1 in morning
29. a 3 hrs  b 40 min  c 35 min  d 55 min
30. a 14.05.69b  23.07.99  c 09.04.01
31. a 5th Aug  b 28th Nov
32. a cuboid  b cone  c pyramid  
   d cube  e sphere  f cylinder
33. a circle  b square  c triangle  d rectangle
34. Drawing
35. “Out of Cafe, turn left, go along Rose St, take 4th road  
on right into Dunn St, down Dunn St take 2nd left into  
Hill Row - cinema is at end of that street.”
36. a  
   b  
   c
37. a/b
38. 90°
39. a Acute  b Obtuse  c Right Angle
40. 90°
41. a table  
   b pansy 6  daisy 9  daffodil 5  rose 3  buttercup 2
42. a Alan  b 4  c 14  
   d Joan is 11 years old, has 2 brothers or sisters and  
weights 34 kg.
43. See graph