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100 N5 Exam Type Questions

FORMULAE LIST

The roots of $ax^2 + bx + c = 0$ are $x = \dfrac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$ or $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

Area of a triangle: $A = \frac{1}{2}ab\sin C$

Volume of a sphere: $V = \frac{4}{3}\pi r^3$

Volume of a cone: $V = \frac{1}{3}\pi r^2 h$

Volume of a pyramid: $V = \frac{1}{3}Ah$

Standard deviation: $s = \sqrt{\dfrac{\Sigma(x - \bar{x})^2}{n - 1}}$

or $s = \sqrt{\dfrac{\Sigma x^2 - \dfrac{(\Sigma x)^2}{n}}{n - 1}}$, where n is the sample size.

100 Exam Questions

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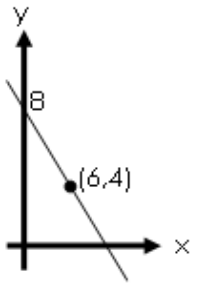
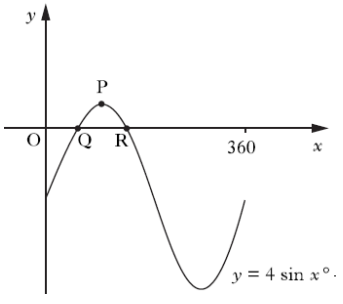
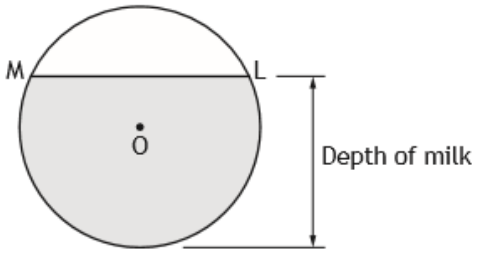
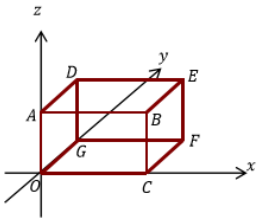
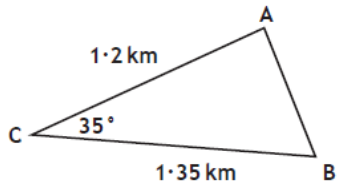
		My Working
1	Evaluate $6\frac{1}{5} - 2\frac{1}{3}$	
2	Find the equation of the line 	
3	Express $a^2(2a^{\frac{-1}{2}} + a)$ in its simplest form	
4	Solve $x - 2(x - 1) = 8$	
5	Solve $4sinx = 2$ for $0° < x < 360°$	

		My Working
6	Find the standard deviation for 3, 8, 14, 20 Give your answer to 3 significant figures	
7	Factorise fully $2x^2 - 32$	
8	A house is bought for £74,000, increases in value 4.5% every year for 3 years. What is its new value?	
9	A triangle has sides 83cm, 79cm and 19cm. Is it right angled?	
10	Find the roots of the equation $y = x^2 - x - 6$	

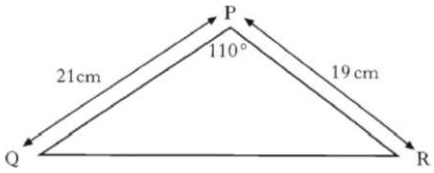
		My Working
11	Evaluate 14.2 + 8.3 x 40	
12	Find the equation of the straight line passing through the points $(2, -3)\ and\ (2, 9)$	
13	Simplify $\frac{\sqrt{12}}{\sqrt{60}}$	
14	Change the subject of the formula to b. $L = 3a - \sqrt{b}$	
15	The graph shows $y = 5sinx - 4$. Find P and Q  	

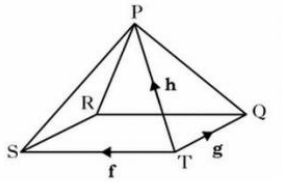
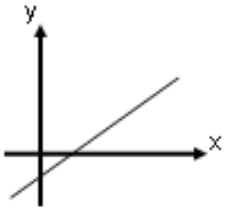
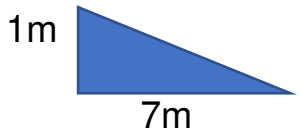
		My Working
16	Solve to one decimal place $2x^2 + 4x - 9 = 0$	
17	Factorise $2x^2 + 7x - 15$	
18	John paid £297.50 for a laptop in a sale. The discount in the sale was 15%. Calculate the original price.	
19	 LM = 1.2 m Radius = 1.8 m Find the depth of milk	
20	Find the roots of the equation $y = \ x^2 - 2x - 15$	

		My Working
21	E has coordinates $(5, 3, 1)$ Find the shortest distance between D and C  	
22	Find the equation of a straight line through $(2, -5)$ and parallel to $y = 3x - 5$	
23	Simplify $x^{\frac{1}{2}}\left(x^{\frac{1}{4}} + 3\right)$	
24	Solve $x - 3(x - 7) = 9$	
25	Sketch the graph of $y = 4cos2x$ for $0 \leq x \leq 360$	

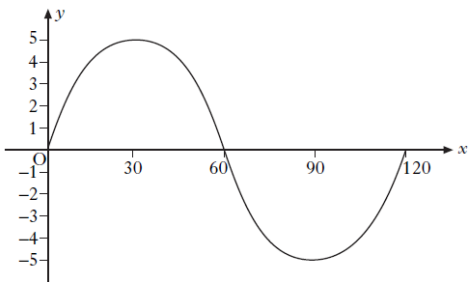
		My Working
26	Find the volume of a sphere with radius 9m, giving your answer to two significant figures	
27	Remove the brackets and simplify $(2x + 2)^2 - 2(x^2 - 2)$	
28	John paid £20,000 for a motorbike but it depreciated 5.5% each year for 7 years. What was its value after 7 years?	
29	 Find length AB	
30	Prove $sin^3x + sinxcos^2x = sinx$	

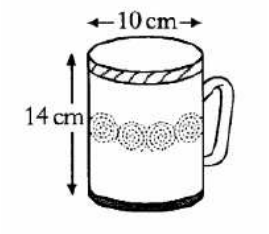
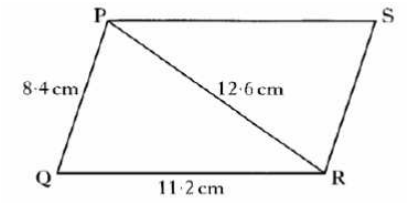
		My Working
31	Evaluate without a calculator: $\frac{2.1+3.2\times 5}{2^3}$	
32	Does the point $(-2,4)$ lie on the line $y=3x+10$? Explain your answer.	
33	Simplify $\sqrt{40}+4\sqrt{10}+\sqrt{90}$	
34	Simplify $(x-5)(3x-2)$	
35	Sketch the graph of $y=3\sin(0.5x)$ for $0\leq x\leq 360$	

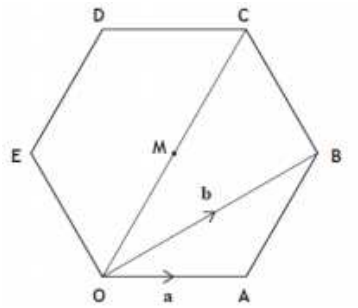
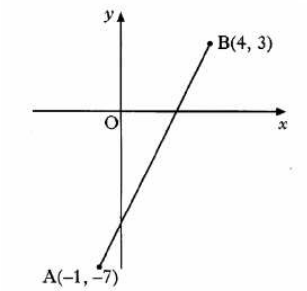
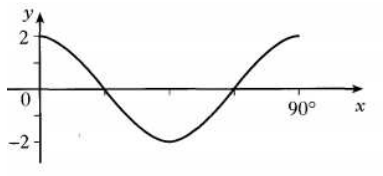
		My Working
36	Solve $3x^2 + 3x - 7 = 0$ giving your answer correct to 1 decimal place	
37	Factorise $6x^2 - 24x - 30$	
38	In a sale, a book now cost £36. What was it worth before a 20% discount?	
39	Find the area of the triangle 	
40	Sketch $y = (x + 2)(x - 3)$ Label the intercepts and turning point	

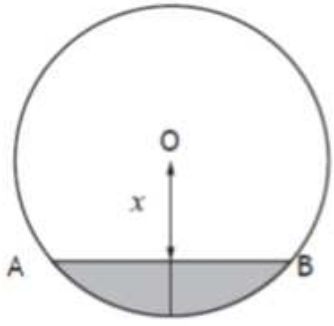
		My Working
41	Express $\overrightarrow{RP}$ in terms of $f, g \text{ and } h$ 	
42	 Chose the correct equation for the above graph a. $y = 2x + 1$ b. $y = -2x + 1$ c. $y = 2x - 1$ d. $y = 2x^2 - 1$	
43	Find the longest side of this right-angled triangle leaving your answer as a surd. 	
44	Solve $11 - 2(1 + 3x) < 39$	
45	Solve $2tanx + 5 = -4$ for $0° < x < 180°$	

		My Working
46	The standard deviation of 1, 2, 2, 2, 8 is $\sqrt{a}$ Find a	
47	Multiply out the brackets and simplify $(3x + 2)(x^2 - 4x + 3)$	
48	The population of the UK is 64.1 million. If it increased by 3% for the next 7 years, what would it be?	
49	The square below has side length y. If the diagonal is 6m. Find the exact length y 	
50	Show that $\frac{1 - cos^2 a}{cos^2 a} = tan^2 a$	

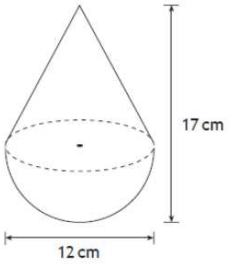
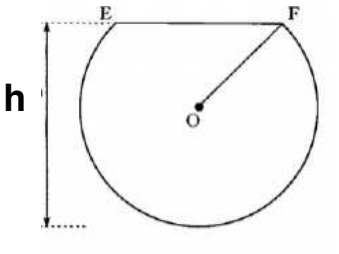
		My Working
51	Evaluate $\frac{5}{12} \times 2\frac{2}{9}$ Give the answer in its simplest form	
52	A straight line has gradient 4 and it passes through the points $(2,4)\ and\ (1,a)$ Find the value of a	
53	Evaluate $2^0 + 3^{-1}$	
54	Change the subject of the formula to u $v^2 = u^2 + 2as$	
55	What is the equation of the graph below?  	

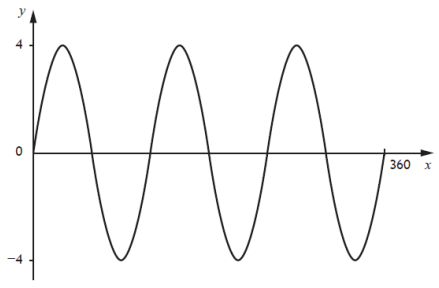
		My Working
56	Calculate the capacity of the cylindrical mug below  	
57	Factorise $(100x^2 - 500x - 2400)$	
58	The restaurant bill included 8% tax. If the bill was £324, what was the bill **before** tax?	
59	Calculate angle PQR  	
60	Write down the turning point and the equation of the axis of symmetry $y = (x - 3)^2 + 4$	

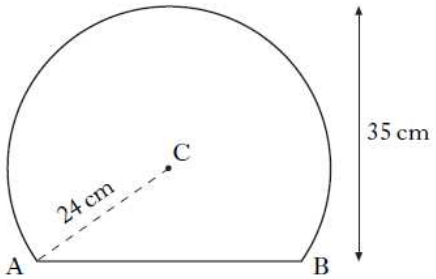
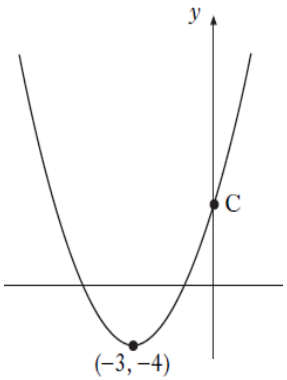
		My Working
61	Express $\overrightarrow{AB}$ in terms of a & b Express $\overrightarrow{OC}$ in terms of a & b 	
62	Find the equation of this line 	
63	Find $27^{\frac{2}{3}}$	
64	Solve $2x - 1 = \frac{x - 4}{3}$	
65	What is the equation of the graph below 	

		My Working
66	Show that the s.d. of 1,1,1,2,5 is $\sqrt{3}$ and write down the s.d. of 101,101,101,102,105	
67	Multiply out and simplify $2(x^2 - 4x + 3) - x(x - 3)$	
68	Rob normally cycles a total distance of 56 miles per week. He increases his distance by 15% each week for the next three weeks. How many miles will he cycle in the third week?	
69	Depth of water in the cylindrical tank is 5m. AB = 18m. Calculate the radius. 	
70	Show that $\frac{tanx}{sinx} = \frac{1}{cosx}$	

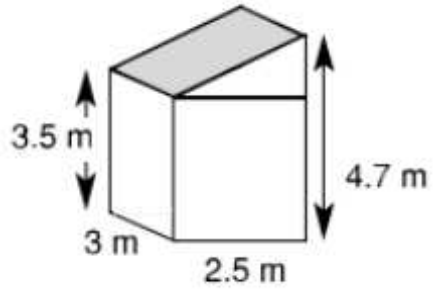
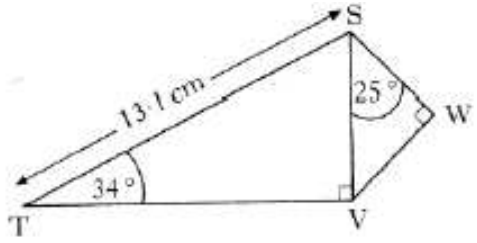
		My Working
71	Without using a calculator find $17.5\%\ of\ £90$	
72	For the straight-line equation $y = mx + c$ When $m > 0$ and $c < 0$ sketch a possible graph	
73	Simplify $\frac{6xy^3}{8x^4y^2}$	
74	Write as a single fraction $\frac{2}{x} + \frac{4}{x-2}$	
75	Solve the equation $11cos\ x° - 2 = 3$ for $(0 \leq x \leq 360°)$	

		My Working
76	Find volume to 2 s.f.  	
77	Factorise $16x^2 - 1$	
78	A 900g box has 20% extra washing powder. How much washing powder was in a standard size box?	
79	EF = 18 m OF = radius = 15 m Find h  	
80	Describe the nature of the roots $y = x^2 - 3x + 3$	

		My Working
81	Evaluate $3\frac{2}{5} - 2\frac{1}{3}$	
82	Find the gradient and y-intercept for the straight line: $3x - 17 = 15y$	
83	Express the below with a rational denominator in its simplest form $\frac{8}{\sqrt{8}}$	
84	Change the subject of the formula to R $P = R^3b - 5$	
85	State the equation of the graph below 	

		My Working
86	Make two valid comparisons for the two maths scores: Class A: Mean = 65%, s.d. = 12% Class B: Mean = 59%, s.d. = 10%	
87	Factorise $4a^2 - 60a - 136$	
88	A new car cost £25000. Its value was expected to decrease every year by 20%. Find its expected value after 7 years.	
89	Find the length AB 	
90	Below is a graph of $y = (x - a)^2 + b$ Find coordinates of c 	

		My Working
91	Find $\|u\|$, the magnitude of $u = \begin{bmatrix} 6 \\ -13 \\ 18 \end{bmatrix}$	
92	Find the equation of a straight line between $(-7, 4)$ and $(-3, 5)$	
93	Express in its simplest form $y^8 \times (y^3)^{-2}$	
94	Solve for y $\frac{2(y-3)}{4} = \frac{y+5}{3}$	
95	Solve algebraically the equation $\sqrt{3} sin\, x° - 1 = 0$ for $0 \leq x \leq 360$	

		My Working
96	Find the total volume of the shape below.  	
97	Multiply out and simplify $(y-2)^3$	
98	I bought a new racing bike for £1500. This included VAT at 20%. What was the cost before VAT was added?	
99	Find the length SW  	
100	Express $x^2 - 14x + 44$ in the form $(x-a)^2 + b$	