Median, Mean, Semi-interquartile Range and Standard Deviation

1. Calculate the **median** and **lower** and **upper quartiles** for each of the following sets of values. Hence, calculate the **semi-interquartile range** of each.

   (a) 13, 13, 15, 19, 23, 23, 24, 26, 27.

   (b) 2·4, 2·6, 2·9, 2·9, 3·1, 3·1, 3·3, 3·6, 3·6, 3·8, 4·1, 4·1, 4·5, 4·7, 4·9, 5·0.

   (c) 101, 108, 109, 112, 112, 115, 120, 121, 125, 131, 131, 134, 135, 138, 140.

2. A group of 25 third year pupils were asked to say how many cousins they had.

   3, 1, 4, 2, 3, 4, 5, 2, 2, 4, 5, 1, 0, 6, 8, 2, 4, 4, 6, 2, 3, 1, 0, 9, 6.

   (a) Re-arrange them in order starting with the lowest.

   (b) Calculate the **mean**, **median** and **modal value**.

   (c) Determine the **lower** and **upper quartiles**.

   (d) Calculate the **range** and the **S.I.Q.R.**

$$s = \sqrt{\frac{\sum x^2 - (\sum x)^2 / n}{(n-1)}}$$

8. Use the above formula to calculate the **mean** and the **standard deviation** of the following :-

   (a) 4, 12, 9, 6.

   (b) 45, 32, 37, 34, 40, 27.

   (c) 6·2, 7·3, 9·1, 5·7, 11·4.

   (d) 115, 130, 122, 129, 130, 133, 136.

Answers

1. a Med 23, Q1 = 14, Q3 = 25, SIQR = 5·5
   b Med 3·6, Q1 = 3, Q3 = 4·3, SIQR = 0·65
   c Med 121, Q1 = 112, Q3 = 134, SIQR = 11

2. a 0,0,1,1,1,2,2,2,2,2,3,3,3,4,4,4,4,4,5,5,6,6,6,8,9
   b Median 3 Mean 3·5 Mode 2 or 4
   c Q1 2 Q3 5 d Range 9 SIQR 1·5

8. a Mean - 7·75, s.d. : 3·5
   b Mean - 35·8 s.d. : 6·31
   c Mean - 7·94 s.d. : 2·33
   d Mean - 127·857 s.d. : 7·11