# Mean,Mode, Median,Rangr

1. The table gives information about the number of brothers that each student in a class has.

| Number of brothers | Frequency | |
|---|---|---|
| 0 | 5 | 0 |
| 1 | 2 | 2 |
| 2 | 8 | 16 |
| 3 | 4 | 12 |
| 4 | 1 | 4 |
| | 20 | |

Calculate the mean number of brothers.

$$\text{mean} = \frac{2 + 16 + 12 + 4}{20} = 1.7$$

2. Here is information about the age, in years, of each of Jelina's five children when written in order.

$$a \qquad b \qquad \frac{b}{2} + a \qquad 2b + a + 3 \qquad 2b + a + 5$$

It is given that

$a$ is the age of the younger child

$a \neq b$

two of the children have the same age

the mean age of the five children is $10.6$ years

Calculate the value of $a$ and the value of $b$

Show clear algebraic working

$$\frac{a + b + \frac{b}{2} + a + 2b + a + 3 + 2b + a + 5}{5} = 10.6$$

$$4a + 5b + \frac{b}{2} + 8 = 53$$

$$8a + 10b + b + 16 = 106$$

$$8a + 11b = 90$$

$$\frac{b}{2} + a = 6$$

$$b + 2a = 2b$$

$$2a = 2b - b$$

$$2a = b$$

$$a = \frac{b}{2}$$

$$8\left(\frac{b}{2}\right) + 11b = 90$$

$$4b + 11b = 90$$

$$15b = 90$$

$$b = 6$$

If $b = 6$,

$$a = \frac{6}{2}$$

$$= 3$$

3. Here are four numbers written in order of size.

$$1.5 \qquad 2 \qquad p \qquad 19.5$$

The mean of the four numbers is three times the median of the four numbers.
Find the value of $p$

$$\text{median} = \frac{2+p}{2}$$

$$\text{mean} = \frac{1.5+2+p+19.5}{4}$$

$$= \frac{23+p}{4}$$

$$3\left(\frac{2+p}{2}\right) = \frac{23+p}{4}$$

$$\frac{(6+3p)^{\times 2}}{(2)^{\times 2}} = \frac{23+p}{4}$$

$$\frac{12+6p}{4} = \frac{23+p}{4}$$

$$12+6p = 23+p$$

$$5p = 23-12$$

$$5p = 11$$

$$p = \frac{11}{5}$$

$$= 2.2$$

4. Here are the twelve most recent batting scores of a cricketer.

23 45 3 56 23 18 78 56 6 87 11 26

Find the median of these twelve scores.

3 6 11 18 23 23 26 45 56 56 78 87

median = $\frac{23+26}{2}$

= 24.5

5. There are 30 students in a class.
All the students in the class take a test.
Here are the marks in the test for the 12 girls in the class.

35 42 67 83 21 24 56 32 69 98 $x$ 49

Where $x > 70$

(a) Find the median of the girls' marks.

21 24 32 35 42 49 56 69 69 $x$ 83 98

$$\text{median} = \frac{49 + 56}{2}$$

$$= 52.5$$

The mean mark for the 12 girls is 54.5

(b) Find the value of $x$.

$$\text{mean} = \frac{21 + 24 + 32 + 35 + 42 + 49 + 56 + 67 + 69 + x + 83 + 98}{12}$$

$$54.5 = \frac{576 + x}{12}$$

$$576 + x = 654$$

$$x = 654 - 576$$

$$= 78$$

The mean mark for the boys is 56

(c) Calculate the mean mark for the 30 students in the class.

$$56 = \frac{y}{30 - 12}, \quad y = 1008 \qquad 30 - 12.$$

$$\text{mean} = \frac{1008 + 654}{30}$$

$$= 55.4$$

6. The ages, in years, of 7 friends are

9 8 7 6 10 $a$ 7

The mean age of the 7 friends is 8 years.

(a) Work on the value of $a$.

$\frac{9+8+7+6+10+a+7}{7} = 8$

$\frac{47+a}{7} = 8$

$47 + a = 56$

$a = 9$

(b) Find the median age of the 7 friends.

6 7 7 8 9 9 10

median = 8

There are 34 passengers on a bus.
The mean age of these passenger is 49 years

11 of these passengers are pensioners
The mean age of these pensioners is 72 years

(c) Calculate the mean age, in years, of the passengers on the bus who are not pensioners.

pensioners

$\frac{x}{11} = 72$

$x = 792$

$\frac{792 + y}{34} = 49$

$792 + y = 1666$

$y = 1666 - 792$

$= 874$

not pensioners,

mean $= \frac{874}{34 - 11}$

$= \frac{874}{23} = 38$

7. Here is the list of four numbers.

$$1.1 \times 10^{15} \quad 2.1 \times 10^{13} \quad 3.2 \times 10^{14} \quad 3.7 \times 10^{16}$$

Find the median of these four numbers.
Give your answer in standard form.

$2.1 \times 10^{13}$ $3.2 \times 10^{14}$ $1.1 \times 10^{15}$ $3.7 \times 10^{16}$

$$\text{median} = \frac{(3.2 \times 10^{14}) + (1.1 \times 10^{15})}{2}$$

$$= 7.1 \times 10^{14}$$

8. Here are the marks that Srinjoy scored in each of 7 tests.

21 24 25 18 28 25 20

(a) Write down the mode of these 7 marks.

mode = 25

After taking an 8th test, Srinjoy's mean mark for all 8 test is 22.5

(b) Calculate his mark for the 8th test.

$$\frac{21 + 24 + 25 + 18 + 28 + 25 + 20 + x}{8} = 22.5$$

$$\frac{161 + x}{8} = 22.5$$

$$161 + x = 180$$

$$x = 180 - 161$$

$$= 19$$

9. Sarah records the number of visits to the cinemas that each of the 19 students in her class made in June.The table below shows her results.

| Number of visits to the cinema | Frequency |
|---|---|
| 0 | 6 |
| 1 | 4 |
| 2 | 5 |
| 3 | 3 |
| 4 | 1 |

0
4
10
9
4
27

+ 14

18
+ 9
27

(a) Write down the mode of the number of visits to the cinema.

mode = 0 no. of visits

(b) Find the median number of visits to the cinema.

median = $\frac{19}{2}$ = 9.5

1 no. of visits.

Bhaskor joins Sarah's class.
The mean number of visits to the cinema, after Bhaskor joins the class, for the 20 students in June is 1.7.

(c) calculate the number of visits to the cinema Bhaskor makes in June.

$\frac{27 + x}{20} = 1.7$

$27 + x = 34$

$x = 34 - 27$

$= 7$

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10. Here are the numbers of items that the last 9 people who visited a shop bought.

6 1 13 20 2 4 14 11 20

Find the median of these numbers of items.

1 2 4 6 11 13 14 20 20

median = 11