

## AVERAGE

<b>Average</b>	Average = Sum of observations / Total Number of observations
<b>Average Speed</b>	Suppose a man covers a certain distance at x kmph and an equal distance at y kmph. Average speed across whole journey = $2xy/(x + y)$ kmph.

### Problems with solutions

1. A grocer has a sale of Rs. 6435, Rs. 6927, Rs. 6855, Rs. 7230 and Rs. 6562 for 5 consecutive months. How much sale must he have in the sixth month so that he gets an average sale of Rs. 6500?

#### Solution

Total sale for 5 months = Rs.  $(6435 + 6927 + 6855 + 7230 + 6562) = \text{Rs. } 34009$ .

Required sale = Rs.  $[(6500 \times 6) - 34009]$

= Rs.  $(39000 - 34009)$

= Rs. 4991.

2. The average of 20 numbers is zero. Of them, at the most, how many may be greater than zero?

#### Solution

Average of 20 numbers = 0.

Sum of 20 numbers  $(0 \times 20) = 0$ .

It is quite possible that 19 of these numbers may be positive and if their sum is a then 20th number is (-a).

3. The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P is:

Let P, Q and R represent their respective monthly incomes. Then, we have:

$$P + Q = (5050 \times 2) = 10100 \quad (\text{i})$$

$$Q + R = (6250 \times 2) = 12500 \quad (\text{ii})$$

$$P + R = (5200 \times 2) = 10400 \quad (\text{iii})$$

$$\text{Add (i), (ii) and (iii), } 2(P + Q + R) = 33000 \quad \text{or} \quad P + Q + R = 16500 \quad (\text{iv})$$

Subtracting (ii) from (iv), we get  $P = 4000$ .

P's monthly income = Rs. 4000.

3. The average weight of A, B and C is 45 kg. If the average weight of A and B be 40 kg and that of B and C be 43 kg, then the weight of B is:

**Solution**

Let A, B, C represent their respective weights. Then, we have:

$$A + B + C = (45 \times 3) = 135 \text{ (i)}$$

$$A + B = (40 \times 2) = 80 \text{ (ii)}$$

$$B + C = (43 \times 2) = 86 \text{ (iii)}$$

$$\text{Adding (ii) and (iii), we get: } A + 2B + C = 166 \text{ (iv)}$$

$$\text{Subtracting (i) from (iv), we get : } B = 31.$$

B's weight = 31 kg.

4. The average weight of 16 boys in a class is 50.25 kg and that of the remaining 8 boys is 45.15 kg. Find the average weights of all the boys in the class.

**Solution**

$$\text{Required average} = \frac{50.25 \times 16 + 45.15 \times 8}{16 + 8}$$

$$= \frac{804 + 361.20}{24}$$

$$= \frac{1165.20}{24}$$

$$= 48.55$$

5. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is:

**Solution**

Since the month begins with a Sunday, to there will be five Sundays in the month.

$$\text{Required average} = \frac{510 \times 5 + 240 \times 25}{30}$$

$$= \frac{8550}{30}$$

$$= 285$$