

Average

1) The average of 11 numbers is 30. If the average of first six numbers is 17.5 and that of last six is 42.5, then what is the sixth number?

a) 30

b) 36

c) 45

d) 47

Explanation: (correct answer - 30)

Average of 11 numbers = 30

Step 1: Calculate total of 11 numbers by multiplying it by average value

$$30 = 11 \times 30 = 330$$

Step 2: Calculate total of first six members by multiplying it by average value

$$17.5 = 17.5 \times 6 = 105$$

Step 3: Calculate total of last six members by multiplying it by average value

$$42.5 = 42.5 \times 6 = 255$$

Therefore, we can find sixth number by adding value of first six and last six numbers and subtracting it from the total value of 11 numbers.

$$\text{Sixth number} = (105 + 255) - 330 = 30$$

2) The average of 15 numbers is 15. If the average of first five numbers is 14 and that of other 9 numbers is 16, then find the middle number.

a. 12

b. 11

c. 10

d. 09

Explanation: (correct answer - 11)

Average of 15 numbers = 15, Average of 5 numbers = 14, Average of 9 numbers = 16

Average = $\frac{\text{Total Numbers}}{\text{No. of Numbers}}$

No. of Numbers

15 = $\frac{\text{Total Numbers}}{15}$

15

Therefore, total numbers = $15 \times 15 = 225$

Middle number = (Total numbers) – [(Average of 5 num x no of num) + (Average of 9 num x no of num)]

$$= (225) - [(14 \times 5) + (16 \times 9)]$$

$$= (225) - [214]$$

$$= 11$$

Therefore, the middle number is 11

3) The average of four consecutive even numbers is 27. Find the largest of these numbers.

- a. 28
- b. 30
- c. 32
- d. 34

Explanation: (correct answer - 30)

Consider the consecutive even numbers as : $x, (x + 2), (x + 4)$ and $(x + 6)$

Average = $\frac{\text{Sum of Quantities}}{\text{Number of Quantities}}$

Number of Quantities

$$\frac{x + (x + 2) + (x + 4) + (x + 6)}{4} = \frac{(4x + 12)}{4} = 27$$

Simplifying we get, $x = 24$

Therefore,

Largest number = $(x + 6) = (24 + 6) = 30$

Smallest number = 24

4) There are two batches A and B of a class. Batch A consists of 36 students and batch B consists of 44 students. Find the average weight of whole class, if average weight of batch A is 40 kg and that of batch B is 35 kg.

- a. 29.23 kg
- b. 32.56 kg
- c. 35.66 kg
- d. 37.25 kg

Explanation: (correct answer - 37.25 kg)

Given: Average weight of batch A = 40 kg , average weight of batch B = 35 kg

1) First find the total weight of all students

- Weight of batch A = $(36 \times 40) = 1440$

- Weight of batch B = $(44 \times 35) = 1540$

Total weight of all students = $(1440 + 1540) = 2980$ kg

2) Find average weight of whole class

(Batch A + Batch B) students = $(36 + 44) = 80$ students

Average Weight = Total weight of all the students = $2980 = 37.25$ kg

No. of Students 80

5) In a school, average marks of three batches of 40, 50 and 60 students respectively is 45, 55 and 70. Find the average marks of all the students.

- a. 54.78
- b. 55.23
- c. 50.36
- d. 58.33

Explanation: (correct answer - 58.33)

We know,

Average = $\frac{\text{Sum of Quantities}}{\text{Number of Quantities}}$

Number of Quantities

Here,

Number of quantities = Number of students in each batch

As average marks of students are given, calculate total marks of each batch first. So total marks for

Batch 1 = $(40 \times 45) = 1800$

$$\text{Batch 2} = (50 \times 55) = 2750$$

$$\text{Batch 3} = (60 \times 70) = 4200$$

$$\text{Sum of marks} = (1800 + 2750 + 4200) = 8750$$

Therefore,

$$\begin{aligned} \text{Required Average} &= \frac{(\text{Sum of Works})}{(\text{Total No. of Students in each batch})} = \frac{(8750)}{(40 + 50 + 60)} = 58.33 \end{aligned}$$

6) The average age of a class of 29 students is 20 years. If the age of teacher is included, then the average increases by 3 months. Find the age of the teacher.

- a. 25.2 years
- b. 27.5 years
- c. 29 years
- d. 31.5 years

Explanation: (correct answer - 27.5 years)

$$\text{Average} = \frac{\text{Sum of Quantities}}{\text{Number of Quantities}}$$

1) First calculate total age of 29 students

$$\begin{aligned} \text{Total age of 29 students} &= (\text{Average age} \times \text{No. of students}) \\ &= (20 \times 29) = 580 \text{ years} \end{aligned}$$

$$\begin{aligned} \text{2) Average age of 29 students + 1 teacher} &= 20 \text{ years} + 3 \text{ months} = 20.75 \text{ years} \\ &= 81 \text{ years} \end{aligned}$$

$$\text{3) Finally, total age of 29 students + 1 teacher} = 81 \times 30 = 607.5 \text{ years}$$

$$\begin{aligned} \text{4) Therefore, age of teacher} &= (\text{Total age of 30 members} - \text{Total age of 29 students}) = (607.5 - 580) = 27.5 \text{ years} \end{aligned}$$

7) The mean of 40 observations was 46. Later on it was found that an observation 38 was wrongly taken as 33. find the corrected value of mean.

- a. 40.23
- b. 42.36
- c. 46.12
- d. 51.23

Explanation: (correct answer - 46.12)

Correct Option: (c)

Average = $\frac{\text{Sum of Quantities}}{\text{Number of Quantities}}$

1) Sum of observations = Average x No. of observations = $46 \times 40 = 1840$

2) Correct sum = Sum of observations + (38 – 33)

= $1840 + (5)$

= 1845

Corrected Mean Value = $\frac{\text{Corrected Sum}}{\text{No. of Observations}} = \frac{1845}{40} = 46.125$

8) John's marks were wrongly entered as 83 instead of 63. If the average marks calculated for the whole class increased by half, then find the number of students in the class.

- a. 30
- b. 35
- c. 40
- d. 45

Explanation: (correct answer - 40)

Correct Option: (c)

Assume number of students in the class be x

As the average increases by half, find the total increase in marks for x students.

Total increase in marks = $(x) \times (1/2) = x/2$

Therefore,

Total increase in marks = False value – true value

$$x/2 = 83 - 63$$

$$x = 40 \text{ students}$$

Alternate solution:

Let A be average and x be number of students

1st entry

$$A + 0.5 = 83 / x \text{ ----- (1)}$$

2nd entry

$$A = 63 / x \text{ ----- (2)}$$

From (1) and (2), we get

$$A + 0.5 - A = 83 - 63$$

9) A person covers a distance of 60 km from P to Q at a speed of 20 km/hr and returns from Q to P at a speed of 30 km/hr. Find the average speed of person.

- a. 22 km/hr
- b. 24 km/hr
- c. 26 km/hr
- d. 28.2 km/hr

Explanation: (correct answer -24 km/hr)

Correct Option: (b)

Hint:

$$\text{Average Speed} = \frac{2 V_1 V_2}{V_1 + V_2}$$

$$(V_1 + V_2)$$

V_1 and V_2 are the speeds at which the person travels.

We are given, that person travels P to Q at a speed of 20 km/hr and Q to P at a speed of 30 km/hr.

$$V_1 = 20 \text{ km/hr and } V_2 = 30 \text{ km/hr}$$

Therefore,

$$\text{Average Speed} = \frac{(2 \times 20 \times 30)}{(20 + 30)} = \frac{1200}{50} = 24 \text{ km/hr}$$

10) An express train runs at an average speed of 27 km/hr including the time of stoppage at stations. Another train runs at an average speed of 41 km/hr excluding the stoppage time at stations. Find how many minutes does a train stop in 1 hour.

- a. 20.52 min
- b. 15.23 min
- c. 12.50 min
- d. 10.75 min

Explanation: (correct answer -20.52 min)

Correct Option: (a)

Train 1: Travels at an average speed of 27 km/hr

Train 2: Travels at an average speed of 41 km/hr

Therefore, train 1 lags train 2 by $(41 - 27)$ km i.e. 14 km.

Now, we have to find the time, train 2 stops in 1 hour.

We know, Speed = Distance / Time

We know, Distance = 14 km, speed = 41 km/hr

Therefore, Time = Distance / Speed = $14 / 41 = 0.342$ hr

Answer is in minutes, hence multiply by 60

$0.342 \text{ hr} = 0.342 \times 60 = 20.52 \text{ min}$