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Averages and weighted averages

Averages and weighted averages

POINTS TO REMEMBER

1) Average = (Sum of observations/Number of observations)

2) Average Speed:

Suppose a man covers a certain distance at X kmph and an equal distance at Y kmph. Then, the average speed during the whole journey is {2xy/(x+y)} kmph.

3) Weighted average

The average between two sets of numbers is closer to the set with more numbers.

Question: 01

The average of first ten prime numbers which are odd is

A. 12.9
B. 13.8
C. 17
D. 15.8

Answer: D

Explanation:

Sum of first 10 prime no. which are odd = 158

Average = 158/10 = 15.8

Question: 02

The average of 11 numbers is 10.9. If the average of first six is 10.5 and that of the last six is 11.4 the sixth number is ?

A. 11.0
B. 11.3
C. 11.5
D. 11.4

Answer: C

Explanation:

1 to 11 = 11 * 10.9 = 119.9
1 to 6 = 6 * 10.5 = 63
6 to 11 = 6 * 11.4 = 68.4
63 + 68.4 = 131.4 – 119.9 = 11.5
6^{th} number = 11.5

Question: 03

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

A. 0
B. 1
C. 10
D. 19

Answer: D

Explanation:

Average of 20 numbers = 0.

Sum of 20 numbers (0 x 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*).

Question: 04

The average weight of 8 person's increases by 2.5 kg when a new person comes in place of one of them weighing 65 kg. What might be the weight of the new person?

A. 76 kg
B. 76.5 kg
C. 85 kg
D. None of these

Answer: C

Explanation:

Total weight increased = (8 x 2.5) kg = 20 kg.
Weight of new person = (65 + 20) kg = 85 kg.

Question: 05

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:

A. Rs.3500
B. Rs.4000
C. Rs.4050
D. Rs.5000

Answer: B

Explanation:

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

P + Q = (5050 x 2) = 10100 .... (i)

Q + R = (6250 x 2) = 12500 .... (ii)

P + R = (5200 x 2) = 10400 .... (iii)

Adding (i), (ii) and (iii), we get: 2(P + Q + R) = 33000 or P + Q + R = 16500 .... (iv)

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

P's monthly income = Rs. 4000.

Question: 06

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

A. 17 kg
B. 20 kg
C. 31 kg
D. 40 kg

Answer: C

Explanation:

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

A + B + C = (45 x 3) = 135 .... (i)

A + B = (40 x 2) = 80 .... (ii)

B + C = (43 x 2) = 86 ....(iii)

Adding (ii) and (iii), we get: A + 2B + C = 166 .... (iv)

Subtracting (i) from (iv), we get : B = 31.

B's weight = 31 kg.

Question: 07

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

A. 47.55 kg
B. 48 kg
C. 48.55 kg
D. 49.25 kg

Answer: C

Explanation:

Required average=(50.25 x 16 + 45.15 x 8) /(16 + 8)
=(804 + 361.20)/24
=1165.20/24
= 48.55

Question: 08

A class of 25 students took a science test. 10 students had an average (arithmetic mean) score of 80. The other students had an average score of 60. What is the average score of the whole class?

A. 68
B. 72
C. 52
D. None of these

Answer: A

Explanation:

Step 1: To get the sum of weighted terms, multiply each average by the number of students that had that average and then sum them up.

$80 \times 10 + 60 \times 15 = 800 + 900 = 1700$

Step 2: Total number of terms = Total number of students = 25

Step 3: Using the formula

$1700/25 = 68$

Answer: The average score of the whole class is 68.

Question: 09

A batsman in his 17^{th} innings makes a score of 85 and their by increasing his average by 3. What is his average after the 17^{th}innings?

A. 34
B. 35
C. 36
D. 37

Answer: D

Explanation:

$16x + 85 = 17(x + 3)$

$x = 34 + 3 = 37$

Question: 10

A man purchased 3 blankets @ Rs.100 each, 5 blankets @ Rs.150 each and two blankets at a certain rate which is now slipped off from his memory. But he remembers that the average price of the blankets was Rs.150. Find the unknown rate of two blankets?

A. Rs.150
B. Rs.225
C. Rs.250
D. None of these

Answer: D

Explanation:

10 * 150 = 1500
3 * 100 + 5 * 150 = 1050
1500 – 1050 = 450

Question: 11

Nine men went to a hotel. Eight of them spent Rs.3 each over their meals and the ninth spent Rs.2 more than the average expenditure of all the nine. Determine the total money spent by them ?

A. 29.25
B. 30
C. 32.50
D. 33

Answer: A

Explanation: 11

Average of 9 = x

9x = 8 * 3 + x * 2 x = 3.25

Total = 9 * 3.25 = 29.25

Question: 12

The average of 11 results is 50, if the average of first six results is 49 and that of the last six is 52. Find the sixth result?

A. 46
B. 56
C. 34
D. 57

Answer: B

Explanation:

1 to 11 = 11 * 50 = 550

1 to 6 = 6 * 49 = 294

6 to 11 = 6 * 52 = 312

6^{th} = 294 + 312 – 550 = 56

Question: 13

The average salary of a person for the months of January, February, March and April is Rs.8000 and that for the months February, March, April and May is Rs.8500. If his salary for the month of May is Rs.6500, find his salary for the month of January?

A. Rs.3000
B. Rs.3500
C. Rs.4500
D. Rs.5000

Answer: C

Explanation:

Sum of the salaries of the person for the months of January, February, March and April = 4 8000 = 32000 ----(1)
Sum of the salaries of the person for the months of February, March, April and May = 4 * 8500 = 34000 ----(2)
(2)-(1) i.e. May - Jan = 2000
Salary of May is Rs.6500
Salary of January = Rs.4500

Question: 14

The average of 35 numbers is 25. If each number is multiplied by 5, find the new average ?

A. 125
B. 134
C. 170
D. 98

Answer: A

Explanation:

Sum of the 35 numbers = 35 * 25 = 875

If each number is multiplied by 5, the sum also gets multiplied by 5 and the average also gets multiplied by 5.

Thus, the new average = 25 * 5 = 125.

Question: 15

The average of the marks of 12 students in a class is 36. If the marks of each student are doubled, find the new average ?

A. 45
B. 72
C. 37
D. 79

Answer: B

Explanation:

Sum of the marks for the 12 students = 12 * 36 = 432. The marks of each student are doubled, the sum also will be doubled.
The new sum = 432 * 2 = 864. So, the new average = 864/12 = 72.

THANK YOU