

How to use this worksheet. Sixteen questions, about 20 minutes, with the answer key at the end. Resist averaging two numbers directly when group sizes or distances differ — convert to totals or times first, average only at the end.

Formula sheet

Convert to a total before averaging, and back to an average only at the end

Average speed for equal distances is total distance/total time, never the average of the two speeds

To combine two ratios sharing a common term, scale both until that term matches

Mean proportional between a and b is $\sqrt{ab}$ | weighted combinations of equal ratios keep the same ratio

Section A · Averages — Simple, weighted and combined averages

Seven questions. Convert to a total before averaging anything.

1. The average of 5, 10, 15, 20 and 25 is:
(1) 12 (2) 15 (3) 18 (4) 20
2. The average of the first 10 natural numbers is:
(1) 5 (2) 5.5 (3) 6 (4) 10
3. The average of the first 5 odd numbers is:
(1) 3 (2) 4 (3) 5 (4) 6
4. The average of 10 numbers is 20. If one number, 15, is removed, the average of the remaining 9 numbers is closest to:
(1) 18.5 (2) 19.5 (3) 20.5 (4) 20.6
5. A car travels 60 km at 30 km/h and returns the same 60 km at 60 km/h. The average speed for the whole trip is:
(1) 45 km/h (2) 40 km/h (3) 50 km/h (4) 42 km/h
6. The average marks of 30 students in one class is 70, and the average marks of 20 students in another class is 80. The combined average of all 50 students is:
(1) 73 (2) 74 (3) 75 (4) 76
7. The average weight of 8 persons increases by 2.5 kg when a new person replaces one of them weighing 60 kg. The weight of the new person is:
(1) 70 kg (2) 75 kg (3) 80 kg (4) 65 kg

Working space — Questions 1 to 7

Write the formula before you substitute.

Section B · Ratios and proportion — Simplifying, dividing and combining ratios

Six questions. Scale ratios to a common term before combining them.

8. The ratio 12 : 18 in its simplest form is:
(1) 3 : 4 (2) 2 : 3 (3) 4 : 5 (4) 1 : 2
9. Rs. 1,200 is divided among three people in the ratio 2 : 3 : 5. The largest share is:
(1) Rs. 240 (2) Rs. 360 (3) Rs. 480 (4) Rs. 600

10. If $a : b = 3 : 4$ and $b : c = 8 : 9$, then $a : c$ is:

- (1) $2 : 3$ (2) $3 : 4$ (3) $8 : 9$ (4) $1 : 2$

11. The mean proportional between 4 and 16 is:

- (1) 8 (2) 10 (3) 6 (4) 20

12. Two numbers are in the ratio $3 : 5$. If their sum is 64, the smaller number is:

- (1) 16 (2) 24 (3) 32 (4) 40

13. If $x : y = 2 : 3$, the value of $(5x + y) : (5x - y)$ is:

- (1) $11 : 5$ (2) $13 : 7$ (3) $12 : 1$ (4) $3 : 1$

Working space — Questions 8 to 13

Write the formula before you substitute.

Section C · Previous year questions — Straight from the AAI ATC papers

Three questions. All three are real previous year questions.

14. The average price of three stationery items A, B and C is Rs. 80. If the average price of A and B is Rs. 77.5 and that of B and C is Rs. 87.5, then the price of B is: **[PYQ 2021 · Shift 3]**

- (1) Rs. 90 (2) Rs. 65 (3) Rs. 85 (4) Rs. 75

15. A batsman makes a score of 79 runs in the 18th innings and thus increases his average by 2. Find his average after the 18th innings. **[PYQ 2021 · Shift 2]**

- (1) 39 (2) 45 (3) 42 (4) 48

16. If $a : b = c : d = e : f = 2 : 3$, then $(xa + yc + ze) : (xb + yd + zf)$ equals: **[PYQ 2021 · Shift 2]**

- (1) $6 : 5$ (2) $2 : 3$ (3) $3 : 2$ (4) $5 : 6$

Working space — Questions 14 to 16

Write the formula before you substitute.

Answer key

Check only after you have attempted every question. Full worked solutions for each one are on the worksheet page at aviatelearnings.com.

1. (2)	5. (2)	9. (4)	13. (2)	
2. (2)	6. (2)	10. (1)	14. (1)	
3. (3)	7. (3)	11. (1)	15. (2)	
4. (4)	8. (2)	12. (2)	16. (2)	

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