

Topics: Average, Percentage, Ratio (Proportionality, Mean Proportion), Basic Algebra (+, -, * with positive & negative numbers, x solve, Square-Cube, their roots), Factors (LCM, HCF), Geometry (angles, lines, triangles) (OLYMPAID LEVEL QUESTIONS)

Attempt all the questions and solve it with patience.

1. A student got 36 marks in a subject and that is 45% of the total.
What are the full marks?
2. A bucket is filled 20% with water. After adding 12 +liters, it becomes 80% full. What is the total capacity of the bucket?
3. 40% of a number is the same as 25% of another number. If the first number is 80, what is the second?
4. A person spends 60% of his money and still has ₹200 left. How much did he have at first?
5. A class has 60 students. 40% are girls. If 5 more girls join and 3 boys leave, what is the new percentage of girls in the class?
6. The average of 5 numbers is 36. If one of the numbers is removed, the new average becomes 34. What number was removed?
7. A batsman's average score for 4 matches is 48. If his scores in 3 matches were 40, 50, and 55, what did he score in the 4th match?
8. The average of four consecutive even numbers is 34. Find the numbers.
9. The average of three numbers is 50. If one number is double the second, and the third is 10 more than the second, what are the numbers?
10. Solve for x:
 $3x+4=(2x+9) * (-4)$
11. The sum of a number and its square is 132. What is the number?
12. A number's cube minus the number is 24. Find the number.
13. If $x^2 = 144$, find cube root of x.
14. $\sqrt{x} + \sqrt{144} = 15$, what is x?
15. (i) $(-8) + 15 + (-6) + (-1) + 5 = ?$ (ii) $(-20) - (-12) - 4 = ?$ (iii) $(-3) \times 5 \times (-2) = ?$

16. In triangle ABC, angle A is $2x$, angle B is $3x$, and angle C is $4x$. Find all angles.
17. A straight line intersects two parallel lines. One angle formed is 110° . Find the other 7 angles.
18. Two angles form a linear pair. If one angle is four times the other, what are the angles?
19. In a triangle, one angle is 90° , and the second is 30° . What type of triangle is it? Find the third angle.
20. Find all the factors of 72. How many of them are also factors of 108?
21. Two numbers are 36 and 60. Find their HCF and LCM. Prove that $\text{HCF} \times \text{LCM} = \text{product of the numbers}$.
22. The HCF of two numbers is 8, and their LCM is 120. If one number is 40, what is the other?
23. A bell rings every 12 seconds, another every 18 seconds. If they ring together at 9:00 AM, when will they ring together next?
24. Find the smallest number that is divisible by 3, 4, 5, 6, and 8 but not by 10.
25. A number when squared and then reduced by 100 gives 476. What is the number?
26. Find the smallest 2-digit number which is both a perfect square and multiple of 4.
27. If cube of a number is 729, what is its square?
28. The square root of a number is equal to its cube root. What is the number?
29. The ratio of boys to girls in a class is 3:4. If there are 36 girls, how many boys?
30. Find x when $4:x = 10:15$
31. In a recipe, the ratio of flour to sugar is 5:2. If you use 300g of flour, how much sugar is needed?
32. $a:b:c$ is in ratio 1:2:4. If sum is 98, find values of a , b , and c .
33. If $a:b = 2:5$ and $b:c = 3:7$, find $a:c$.
34. If three numbers are in the ratio 2:3:4 and their product is 1728, find the numbers.

35. Find numbers in the ratio $a:b:c$ such that $a \times c = b^2$ and $a + b + c = 98$ and the ratio is 1:2:4.
36. The perimeter of a triangle is 72 cm. If the sides are in the ratio 2:3:4, find the length of each side.
37. The sum of two numbers is 100. Their HCF is 10 and LCM is 300. Find the numbers.
38. In a right-angled triangle, one side is 6 cm, another is 8 cm. Find the third side and type of triangle.
39. A number is divisible by 2, 3, and 5 but not divisible by 4 or 10. What is the smallest such number?
40. 60% of a number is equal to the average of 20 and 40. What is the number?
41. In a quiz competition, 60% participants were boys and the rest girls. The average score of boys was 50, girls was 70. What was the average score of all participants?
42. A man divides ₹10,000 between A, B, and C in the ratio 2:3:5. What percentage of the money does C receive?
43. The average of three numbers is 50. The ratio of the first to the second is 2:3. The third is equal to the first. Find all three numbers.
44. The total salary of 3 workers is ₹48,000. Their salaries are in the ratio 4:5:7. What is the average salary?
45. 25% of a number is 10 more than 20% of it. What is the number?
46. A shopkeeper increases the price of an item by 25% and then gives a 20% discount on the increased price. What is the overall percentage change in the price?
47. Are the ratios 6:9 and 10:15 in proportion?
48. Are 4,6,9 in mean proportion?
49. A number is mean proportional between 4 and 100. Find it.
50. A student scored 36 out of 45 marks in a test. What is his percentage score?