

1. A machine was available for ₹ 36842.40, which included three successive discounts of 20%, 15% and 10% on the list price and a GST of 12% on the remaining price. Find the list price of the machine.
2. A manufacturer sells a dish washer to a wholesaler for ₹18000. The wholesaler sells it to a dealer at a profit of ₹1500 and the dealer sells it to a consumer at a profit of ₹2500. If the rate of GST is 12% and assuming that all transactions occur within the same state, calculate
 - (i) the total amount of GST received by the Central and the State Government on the sale of this dish washer from the manufacturer to the consumer
 - (ii) the amount paid by the consumer for the dish washer.
3. Kavita has a cumulative time deposit account in a bank. She deposits ₹ 800 per month and gets ₹ 16700 as maturity value. If the rate of interest be 5% per annum, find the total time for which the account was held.
4. Ashish deposits ₹ 250 per month for 1 ½ year in a cumulative time deposit scheme. If the rate of interest be 8% per annum. Find the amount received at the time of maturity.
5. A box containing 8 red, 4 white and 3 black balls. One ball is drawn at random. What is the probability that the ball drawn is
 - (i) White (ii) Red or White (iii) neither red nor white (iv) not red
6. A box contain 15 balls bearing 1, 2, 3, 4 ... 14, 15 respectively. A ball is drawn at random from the box. Find the probability that the number on the ball is
 - (i) an even number (ii) a number divisible by 5 (iii) the number 6
 - (iv) a number lying between 8 and 12 (v) a number greater than 9
 - (vi) a number less than 6
7. Solve $\sqrt{3x^2 + x + 5} = x - 3$
8. Solve $x^2 - 6x - 15 = 0$. Give your answer correct to two decimal places.
9. The distance by road between two towns A and B. The distance by road between towns A and B is 216 km and by rail it is 208 km. A car travels at a speed of x km/hr and the train travels at a speed which is 16 km/hr faster than the car.
 - (i) Write down the time taken by the car to reach town B from A, in terms of x .
 - (ii) Write down the time taken by the train to reach town B from A, in terms of x .
 - (iii) If the train takes 2 hours less than the car to reach town B, obtain an equation in x and solve it.
 - (iv) Hence, find the speed of the train.
10. If $(c^2 - ab)x^2 - 2(a^2 - bc)x + (b^2 - ac) = 0$ show that either $a = 0$ or $a^3 + b^3 + c^3 = 3abc$
11. The mid – points of the sides BC, CA, and AB of $\triangle ABC$ are D(2,1), E(-1, -3) and F(4,5) respectively. Find the co – ordinates of A, B, and C.
12. Find the co – ordinates of the intersection of the medians of the triangle whose vertices are A(-7, 5), B(-1, -3) and C(5, 7).
13. Find the equation of the perpendicular dropped from the point (-1, 2) onto the line joining the point (-1, 2) onto the line joining the points (1, 4) and (2, 3).
14. Find the equation of a line with x – intercept = 5 and passing through the point (4, -3).
15. Let $A = \{x \in R : 11x - 5 > 7x + 3\}$ and $B = \{x \in R : 8x - 9 \geq 15 + 2x\}$. Find $A \cap B$ and represent the solution set on a number line.

16. If $x^3 + ax^2 + bx + 6$ has $x - 2$ as a factor and leaves a remainder 3 when divided by $x - 3$. Find the values of a and b .

17. Using factor theorem, show that $(x - 3)$ is a factor of $x^3 - 7x^2 + 15x - 9$. Hence factorize the given expression completely.

18. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I = 0$

19. Show that $\cos \theta \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix} + \sin \theta \begin{bmatrix} \sin \theta & -\cos \theta \\ \cos \theta & \sin \theta \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

20. If $(3x + k)$, $(2x + 9)$ and $(x + 13)$ are three consecutive terms of an AP. Find k .

21. Find the 4th term from the end of the GP $\frac{2}{81}, \frac{2}{27}, \frac{2}{9}, \dots \dots 54$.

22. $\cot^2 \alpha \frac{\sec \alpha - 1}{1 + \sin \alpha} + \sec^2 \alpha \frac{\sin \alpha - 1}{\sec \alpha + 1} = 0$

23. If $\sin^4 \theta + \sin^2 \theta = 1$, show that, $\tan^4 \theta - \tan^2 \theta = 1$.

24. Use a graph for this question. Plot the points P(3, 2) and Q(-3, -2). From P and Q draw perpendiculars PM and QN on the $x -$ axis.

(i) Name the image of P on reflection in the origin.

(ii) Assign a special name to the geometrical figure PMQN and find its area.

(iii) Write the co-ordinates of the point to which M is mapped on reflection in the
(a) $x -$ axis (b) $y -$ axis (c) origin.

25. If the mean of the following distribution is 7.5, find the missing frequency f :

Variable	5	6	7	8	9	10	11	12
Frequency	20	17	f	10	8	6	7	6

26. Marks obtained by 200 students in an examination are given below:

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
No. of Students	5	10	14	21	25	34	36	27
							80 - 90	90 - 100
							16	12

Draw an ogive for the following distribution taking 2 cm = 10 marks on one axis and 2 cm = 20 students on other axis. From the graph, find :

(i) the median, (ii) the upper quartile (iii) number of students scoring more than 65 marks (iv) if 10 students qualify for merit - scholarship find the minimum marks required to qualify.