

CLASS X : MATHEMATICS PAPER SET- 2

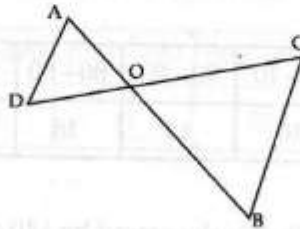
1. Find the decimal form of $\frac{3}{8}$.
2. Two lines are given to be parallel. The equation of one of the line is $4x + 3y = 14$. What is the equation of the second line.
3. If $\triangle ABC \sim \triangle DEF$, $BC = 4$ cm, $EF = 5$ cm and area of $\triangle ABC = 80$ cm², then find area of $\triangle DEF$.
4. Consider the following frequency distribution :

Monthly Income (in ₹)	Number of families
More than or equal to 10000	100
More than or equal to 13000	85
More than or equal to 16000	69
More than or equal to 19000	50
More than or equal to 22000	33
More than or equal to 25000	15

Find the number of families having income range from ₹ 16000 to ₹ 19000.

SECTION – B

5. Check whether the polynomial $g(x) = x^2 + 3x + 1$ is a factor of the polynomial $f(x) = 3x^4 + 5x^3 - 7x^2 + 2x + 4$.
6. For what value of k , the pair of equations $kx + 3y = k - 3$, $12x + ky = k$ has unique solution.
7. In the given figure, $OA \times OB = OC \times OD$, show that $\angle A = \angle C$ and $\angle B = \angle D$.

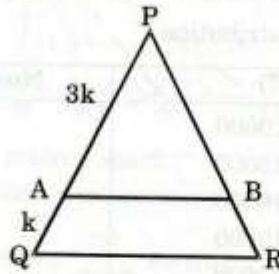


8. If $\cos(A - B) = \frac{\sqrt{3}}{2}$ and $\sin(A + B) = \frac{\sqrt{3}}{2}$, find A and B , where $(A + B)$ and $(A - B)$ are acute angles.
9. Prove that: $\sqrt{\frac{1 - \cos A}{1 + \cos A}} = \operatorname{cosec} A - \cot A$
10. Find the mean of first five odd multiples of 5.

SECTION – C

11. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and is to contain cartons of the same drink, what would be the greatest number of cartons each stack would have ?
12. Prove that $\sqrt{3}$ is irrational.

13. Show that $\frac{1}{2}$ and $\frac{-3}{2}$ are the zeroes of the polynomial $4x^2 + 4x - 3$ and verify the relationship between zeroes and co-efficients of polynomial.
14. The taxi charges in a city comprise of a fixed charge together with the charges for the distance covered. For a journey of 10 km the charge paid is ₹ 75 and for a journey of 15 km the charge paid is ₹ 110.
- What will a person have to pay for travelling a distance of 25 km ?
 - Which mathematical concept is used in this question ?
 - What is its value ?
15. In the given figure $\frac{PA}{AQ} = \frac{PB}{BR} = 3$. If the area of ΔPQR is 32 cm^2 , then find the area of the quadrilateral AQRB.



16. D, E and F are the mid points of the sides BC, CA and AB respectively of ΔABC . Determine the ratio of the areas of ΔDEF and ΔABC .
17. Prove that : $\frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} + \frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta} = \frac{2}{2\sin^2 \theta - 1}$.
18. Evaluate : $\frac{\sec 41^\circ \cdot \sin 49^\circ + \cos 29^\circ \cdot \operatorname{cosec} 61^\circ - \frac{2}{\sqrt{3}} (\tan 20^\circ \cdot \tan 60^\circ \cdot \tan 70^\circ)}{3(\sin^2 31^\circ + \sin^2 59^\circ)}$.

19. The following tables shows the weights (in gms) of a sample of 100 apples, taken from a large consignment :

Weight (in gms)	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130
No. of Apples	8	10	12	16	18	14	12	10

Find the median weight of apples.

20. The following distribution shows the marks scored by 140 students in an examination. Calculate the mode of the distribution :

Marks	0-10	10-20	20-30	30-40	40-50
Number of students	20	24	40	36	20

SECTION - D

21. Prove that $n^2 - n$ is divisible by 2 for every positive integer n .
22. If α and β are the zeroes of polynomial $p(x) = 3x^2 + 2x + 1$, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$.

23. Solve the following pair of linear equations graphically :

$$2x + 3y = 12, 2y - 1 = x.$$

Determine the co-ordinates of the vertices of the triangle formed by the lines represented by these equations with the x-axis.

24. If a bag containing red and white balls, half the number of white balls is equal to one-third the number of red balls. Thrice the total number of balls exceeds seven times the number of white balls by 6. How many balls of each colour does the bag contain ?
25. If two sides and a median bisecting one of these sides of a triangle are respectively proportional to the two sides and the corresponding median of another triangle, then prove that the two triangles are similar.
26. A vertical tree 12 m long casts a shadow 8 m long on the ground. At the same time a tower casts the shadow 40 m long on the ground.
- (i) Determine the height of the tower.
- (ii) Which mathematical concept is used in this problem ?
- (iii) What is the value stressed upon in this problem ?

27. Prove that : $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta.$

28. Prove that : $\frac{\sec \theta + \tan \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{\cos \theta}{1 - \sin \theta}.$

29. Prove that : $\left(\frac{1 + \tan^2 A}{1 + \cot^2 A} \right) = \left(\frac{1 - \tan A}{1 - \cot A} \right)^2 = \tan^2 A.$

30. Find the values of x and y, if the median for the following data is 31.

Classes	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total
Frequency	5	x	6	y	6	5	40

31. The following table gives the life time of 200 bulbs. Calculate the mean life time of a bulb by step deviation method :

Life time (in hours)	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999
Number of bulbs	24	47	39	42	34	14