

All questions are compulsory

Section A

1. The polynomial $2x^3 - kx^2 + 7x + 1$ when divided by $x - 2$, leaves remainder 5. Then find the value of k .
2. Write the linear equation such that each point on its graph has an ordinate 3 times its abscissa.
3. $\angle A$ and $\angle B$ are complementary angles. If $\angle A = (x + 12)^\circ$ and $\angle B = 2(x + 6)^\circ$. Find the value of x .
4. The volume of a cylinder is $448\pi \text{ cm}^3$ and height 7 cm. Find its radius.
5. Find two the rational numbers between 2 and 3.
6. Find the range of the data 5,7,5,3,7,7,18,4,6,7.

(1x6=6)

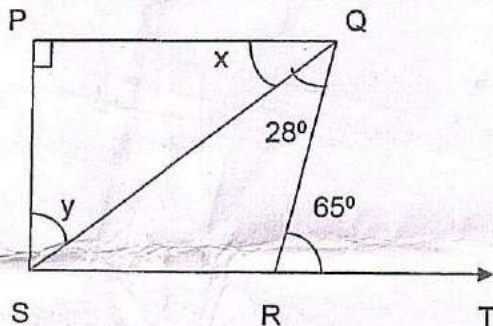
Section B

7. Find area of triangle, two sides of which are 16 cm and 22 cm and perimeter is 64 cm.
8. Prove that a diagonal of a parallelogram divides it into two triangles of equal area.
9. Solve the equation $x + 4 = 10$ and state Euclid's axiom used.
10. Prove that the line drawn through the centre of a circle to bisect a chord is perpendicular to the chord.
11. Find the product $(5a - 3b)(25a^2 + 15ab + 9b^2)$ by using identity.
12. Diagonals AC and BD of a quadrilateral ABCD intersect at O in such a way that $\text{ar}(AOD) = \text{ar}(BOC)$. Prove that ABCD is a trapezium.

(2x6=12)

Section C

13. Factorise $9x^2 + y^2 + z^2 - 6xy + 2yz - 6zx$ and hence find its value when $x = 1$, $y = -2$ and $z = 1$.
14. Plot the points $(-5, 1)$ and from it draw PM and PN perpendicular to x-axis and y-axis respectively. Write the co-ordinates of M and N.
15. In figure if $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y .



16. Represent $\sqrt{6.3}$ geometrically. Write the steps of construction.
17. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. find the area of the sheet required to make 10 such caps.
18. A field in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non-parallel sides are 14 m and 13 m. Find the area of the field.
19. Find whether $(\sqrt{2}, 3\sqrt{2})$ is a solution of $x - 3y = 9$ or not. Find two more solutions..

20. Draw a histogram for the following data:

| | | | | | | | |
|----------------------|-------|-------|-------|-------|-------|-------|-------|
| Marks | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 |
| Number of candidates | 7 | 9 | 8 | 5 | 10 | 12 | 8 |

21. The mean marks of 100 students was found to be 40. If by mistake, the tabulator took 08, 29 and 18 instead of correct marks 88, 92 and 81. Find the correct mean.

22. The following table gives the daily wages for the same job of 1000 technical staff of a reputed industry:

| | | | | |
|-------------------|---------|---------|---------|---------|
| Wages(Rs) | 300-350 | 351-400 | 401-450 | 451-500 |
| No of technicians | 280 | 175 | 420 | 125 |

If a technician is chosen at random, find the probability that he is getting

- (a) at least Rs 351 daily
- (b) at the most Rs 450 daily
- (c) either less than Rs 300 or more than Rs 500 daily.

(3x10=30)

Section D

23. Prove that the quadrilateral formed by internal angle bisectors of any quadrilateral is cyclic.

24. If $(x + 1)$ and $(x + 2)$ are the factors of $x^3 + 3x^2 - 3ax + b$, then find a and b.

25. Construct triangle PQR in which $QR = 6$ cm, $\angle Q = 60^\circ$ and $PR - PQ = 2$ cm

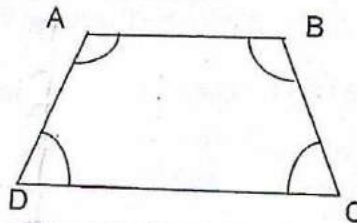
26. If $x = 9 + 4\sqrt{5}$, find the value of $x^4 + \frac{1}{x^4}$

27. Two triangles are congruent if two angles and included side of one triangle are equal to two angles and the included side of other triangle. Prove it.

28. Draw the graph of the following linear equations: $x - y = 7$ and $2x = y + 3$. At what points does the graph of each equation cuts the x axis.

29. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$ show that

- (i) $\angle A = \angle B$
- (ii) $\angle C = \angle D$
- (iii) $\triangle ABC \cong \triangle BAD$
- (iv) diagonal AC = diagonal BD



30. It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per m^2 , find

- (i) inner curved surface area of the vessel.
- (ii) radius of the base.
- (iii) capacity of the vessel.

(4x8=32)