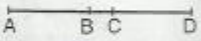
Section-B

5. Simplify : $\frac{2^{30} + 2^{29} + 2^{28}}{2^{31} + 2^{30} - 2^{29}}$

6. In the given figure, AC = BD. Prove that AB = CD, state the Euclid's axioms / postulates used for the same.



7. Find p if $(x - 1)$ is a factor of $g(x) = 2x^2 + px + \sqrt{2}$

8. Prove that all angles of an equilateral triangle are 60° each.

9. Find the product of $(x + 1/x)$, $(x - 1/x)$, $(x^2 + 1/x^2)$ and $(x^4 + 1/x^4)$

OR

Factorise $64m^3 - 343n^3$

10. (i) State the quadrant in which the following points lie :

A (– 3, – 1) and B (– 1, 2)

(ii) Write the abscissa of (– 5, 0)

(iii) Write the ordinate of (6, 7)

Section-C

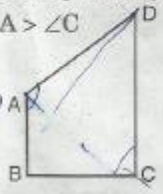
11. Represent $\sqrt{9.3}$ on the number line.

12. (i) Calculate the value of $12^3 + (-7)^3 + (-5)^3$ without calculating the cubes.

(ii) Write a binomial of degree 11

(iii) Find the value of $p(-2)$ if $p(x) = 5x - 4x^2 + 3$

13. In the given figure, AB & CD are respectively the smallest and longest side of quadrilateral ABCD. Show that $\angle A > \angle C$

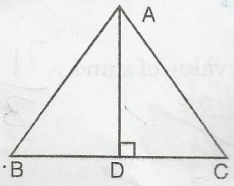


14. Sides of a triangle are in the ratio 12 : 17 : 25 and its perimeter is 540 cm. Calculate the area of the triangle.

15. If $a = 2$ and $b = 3$, then find the value of the following :

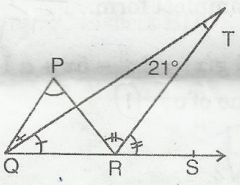
(a) $(a^b + b^a)^{-1}$ (b) $(a^a + b^b)^{-1}$

16. In ΔABC, AD is a perpendicular bisector of BC. Prove that AB = AC and AD bisects $\angle A$.



17. If $x + \frac{1}{x} = 7$, find the value of $x^3 + \frac{1}{x^3}$

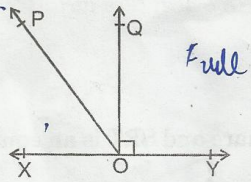
18. In the given figure, side QR of ΔPQR is produced to point S. The bisectors of $\angle PQR$ and $\angle PRS$ meet at point T and $\angle QTR = 21°$, find $\angle QPR$.



OR

In th given figure, XOY is a straight line and $OQ \perp XY$ at O. Prove that

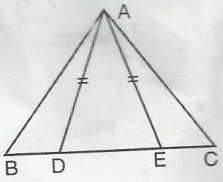
$2\angle QOP = \angle YOP - \angle XOP$



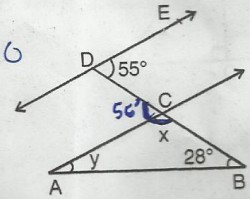
19. Prove that if two parallel lines are intersected by a transversal then the bisectors of any pair of alternate interior angles are parallel.

OR

In the given figure, D and E are points on BC such that BD = CE and AD = AE. Prove that $\Delta ABE \cong \Delta ACD$.



20. In the given figure, AC || DE, find the value of x and y.



Section–D

21. Express $2.3\overline{6} + 0.\overline{23}$ as a fraction in simplest form.

22. Polynomials $p(x) = ax^3 + 3x^2 - 3$ and $g(x) = 2x^3 - 5x + a$ leave the same remainder when divided by $(x - 4)$. Find the value of a.

23. Simplify : $\dfrac{\sqrt{6}}{\sqrt{2}+\sqrt{3}} - \dfrac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \dfrac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}}$

OR

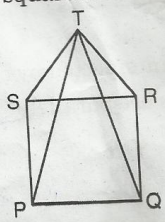
Find the value of a and b in the following :

$$\frac{3-\sqrt{5}}{3+2\sqrt{5}} = a\sqrt{5} + b$$

24. In the given figure, PQRS is a square and SRT is an equilateral triangle. Prove that

(i) PT = QT

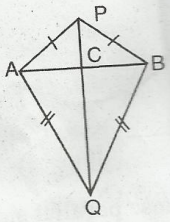
(ii) $\angle TQR = 15°$



25. Use suitable identities to evaluate the following :

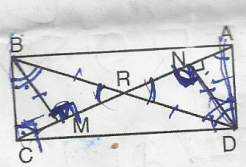
(i) $\left(2\sqrt{3}y - 5a + \frac{c}{4}\right)^2$ (ii) $(96)^3$

26. AB is a line segment, P and Q are points on opposite sides of AB such that each of them is equidistant from points A and B. Show that line PQ is a perpendicular bisector of AB.

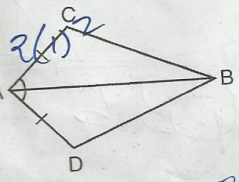


OR

In the given figure, BM and DN are perpendicular to segment AC. Also, ABCD is a rectangle. Prove that AC bisects BD.



27. A farmer has a plot of land in shape of a quadrilateral ABCD where AC = AD and AB bisects ∠A. The farmer distributed his plot between his son and daughter such that ΔABC was given to his son and ΔADB to his daughter. Give three values inculcated by the farmer to his children and prove ΔABC ≅ ΔABD



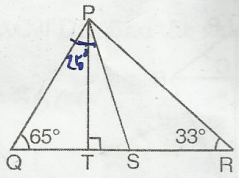
28. Factorise : $x^3 - 5x + 6 - 2x^2$

29. Plot the points A (4, – 1) and B (2, 1) on a graph paper and draw a line AB joining these points :

(i) Write coordinates of any one point which lie on this line AB.

(ii) Write coordinates of any one point which do not lie on this line AB.

30. In the given figure, PT ⊥ QR and PS bisects ∠QPR. If ∠Q = 65° and ∠R = 33°, find ∠TPS.



31. A field is in 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.