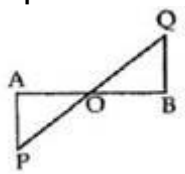
Section A

Question numbers 1 to 4 carry one mark each.

1. Simplify $2\sqrt{3}+\sqrt{3}$

2. Factorise : $8y^3-125x^3$

3. In the given figure, O is the mid-Point of AB and $\angle BQO=\angle APO$, then $\angle OAP$ is equal to which angle?



4. If (a, b) = (0, -2), find value of a and b

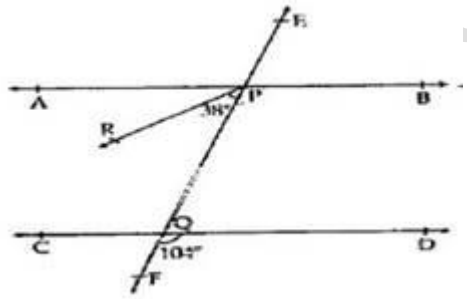
Section B

Question numbers 5 to 10 carry two marks each.

5. Rationalize $\frac{7}{\sqrt[3]{3}-\sqrt[3]{2}}$

6. If 3x + 2y= 12 and xy = 6, then find $27x^3+8y^3$.

7. In the figure, PR is the angle bisector of $\angle APQ$. Prove that AB||CD.



8. If a point P lies between two points A and B such that AP = BP, then prove that $AP=\frac{1}{2}AB$.

9. Plot three points A(4, 0), B(0,-4) and C(-4, 0) on the coordinate place. Now plot point D so that ABCD is a rhombus. Give coordinates of the point D.

10. Find the area of the right angled triangle in which sides other than hypotenuse are 18 cm and 80 cm. Also, find the perimeter of the triangle.

Section C

Question numbers 11 to 20 carry three marks each.

11. Show that $\left(a^{x-y}\right)^{x+y}\left(a^{y-z}\right)^{y+z}\left(a^{z-x}\right)^{z+x}=1$

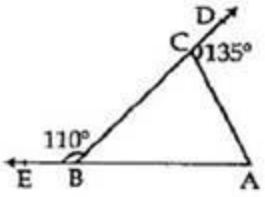
12. Simplify : $\left[5\left(8^{1/3}+27^{1/3}\right)^{3}\right]^{1/4}$

13. find the product of $\left(a-\frac{1}{a}\right)\left(a+\frac{1}{a}\right)\left(a+\frac{1}{a^2}\right)\left(a^4+\frac{1}{a^4}\right)$ using a suitable identify

14. Evaluate 92^3, using a suitable identify.

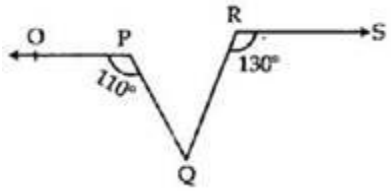
15. Prove that the two lines which parallel to the same line, are parallel to each other.

16. In the figure, sides AB and BC of AABC are produced to point E and D respectively. If $\angle EBC=110^\circ$ and $\angle ACD=135^\circ$, Find $\angle BAC$.



17. If a transversal intersects two parallel lines, the prove that bisectors of alternate interior angles are parallel.

18. In the given figure, OP||RS. If $\angle OPQ=110^\circ$ and $\angle SRQ=130^\circ$, find $\angle PQR$.



19. Plot the points (2, 3), (-2, 3), (-2, -3) and (2, -3) on a graph sheet. Join these points in order. Identify the figure obtained. Also, find the area of the figure.

20. In a four-sided field, the length of the longer diagonal is 120 m. The lengths of the perpendiculars from the opposite vertices upon this diagonal are 127 m and 7.3 m. Find the area of the field.

Section D

Question numbers 21 to 31 carry four marks each.

21. Find a and b if $\frac{3-\sqrt{6}}{3+2\sqrt{6}} = a\sqrt{6} - b$

22. Express $0.\overline{3178}$ in the form of p/q where p and q are integers and $q \neq 0$.

23. Prove that $(X+Y)^3 + (y+z)^3 + (z+x)^3 - 3(x+y)(y+z)(z+x) = 2(x^3 + y^3 + z^3 - 3xyz)$

24. Divide polynomial $p(x) = x^4 - 4x^3 + 4x^2 - 3x + 4$ by $q(x) = x - 1$ and find what should be added in p(x) so that it is divisible by q(x).

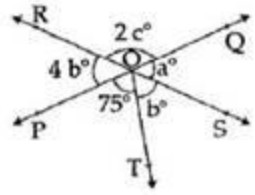
25. Using factor theorem, show that (m − n), (n − P) and (p − m) are factors of $m(n^2 - p^2) + n(p^2 - m^2) + p(m^2 - n^2)$.

26. Show that 2x − 1 is a factor of the polynomial $2x^3 - x^2 + 6\sqrt{2x^2} - \sqrt[3]{2x} + 8x - 4$ Hence factories' the polynomial.

27. For spreading the message "Save Girl Child Save Future" a rally was organized by some students of a school. They were given triangular cardboard piece PQR which they divided in to two parts by drawing the angle bisectors QO and RO of base angles Q and R and wrote a slogan. Prove that $\angle QOR = 90° + \frac{1}{2}\angle P$ What is the benefit of these types of rallies?

28. "A square is a polygon made up of four line segments, cut of which, length of three line segments are equal to the length of fourth one and all its angles are right angles".
Define the terms used in this definition which have been highlighted/underlined.

29. In the figure, two straight line PQ and RS intersect each other at O.
If $\angle POT = 75°$ find the values of a, b and c.



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

31. The angles of a triangle are $(x-40)^0$, $(x-20)^0$ and $\left(\frac{X}{2}-10\right)^0$. Find the value of x and then the angles of the triangle.