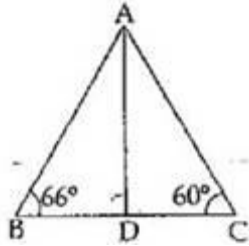## Section A

Question number 1 to 4 carry one mark each.

Q.1 Which is the greatest among $\sqrt{2}$, $\sqrt[3]{4}$ and $\sqrt[4]{3}$?

Q.2 If 2x+1 is one factor of the polynomial $2x^2 - x - 1$, then find the other factor.

Q.3 In the given figure, $\angle ABD = 66°$ and $\angle ACD = 60°$. If bisector of $\angle A$ meets BC at D, then find $\angle ADB$.
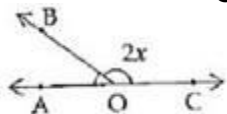

Q. 4 What do you mean by ordinate of point?
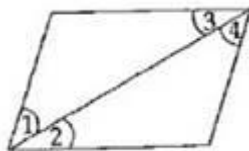
Section B

Question number 5 to 10 carry two marks each.

Q.5 Is zero (0) a rational number? Justify your answer.

Q.6 Factories': $3y^3 + y^2 - 3y - 1$

Q.7 In the figure, if $\angle AOB = 60°$ and $\angle BOC = 2x$, then find the value of x so that AOC is a straight line.
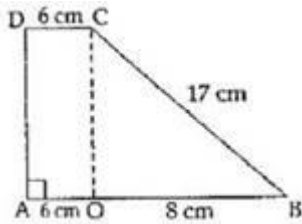

Q.8 In the give figure; if $\angle 1 = \angle 3$, $\angle 2 = \angle 4$ and $\angle 3 = \angle 4$, write a relation between $\angle 1$ and $\angle 2$ by using an Euclid's axiom. Write the axiom also.

Q.9 A point is a distance of 4 units from z-axis and 5 units from the y-axis. Represent the position of the point in the Cartesian plane and also write its co-ordinates.

Q.10 Compute the area of the trapezium shown in the figure:

Section C

Question number 11 to 20 carry three marks each.

Q.11 Simplify : $\sqrt[4]{81x^8y^4z^{16}}$

Q.12 If $x = 2 + \sqrt{3}$; find the value of $x^3 + \dfrac{1}{x^3}$

**Q.13** Using a suitable identity, evaluate $(43)^3 - (18)^3 - (24)^3$.

Q.14 Let R_1 and R_2 are the remainders when the polynomials $f(x) = 4x^3 + 3x^2 - 12ax - 5$ and $g(x) = 2x^3 + ax^2 - 6x - 2$ are divided by (x-1) and (x-2) respectively. If $3x_1 + R_2 - 28 = 0$, find the value of 'a'.

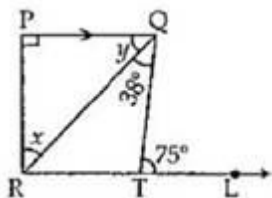**Q.15** Write any three Euclid's Postulate.

Q.16 In the give figure, if the line segment AB is parallel to another line segment RS and O is the mid-point of As, then Show that :

(a) $\triangle AOB \cong \triangle SOR$

(ii) O is also mid-point of BR
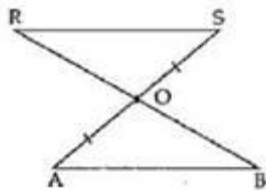
Q.17 In the figure, $PQ \perp PR$, PQ || RL, $\angle RQT = 38°$ and $\angle QTL = 75°$. Find x and y.

Q.18 Prove that if two lines intersect, vertically opposite angles are equal.

Q.19 On the graph paper, plot a point A(-2,-2). Reflect point A in x-axis and y-axis. Let these points be B and C respectively. Guess the measure of $\angle BAC$.

Q.20 The Perimeter of a triangular garden is 900 cm and its sides are in the ratio $3:5:4$. Using Heron's formula, find the area of the garden.

Section D

Question number 21 to 31 carry four marks each.

Q.21 Express in the form of $\frac{p}{q}$: $0.3\overline{8} + 1.2\overline{7}$

Q.22 Rationalise the denominator of the following: $\dfrac{3}{\sqrt{3}+\sqrt{5}-\sqrt{2}}$

Q.23 If ab + bc + ca = 0 find value of $\dfrac{1}{a^2-bc}+\dfrac{1}{b^2-ca}+\dfrac{1}{c^2-ab}$

Q.24 Verify if -3 and 4 are zeroes of the polynomial $2x^3 - 3x^2 - 23x + 12$. If yes, then factorise the polynomial.

Q.25 Using long division method, show that the polynomial p(x)= x³ +1 is divisible by q(x) = x+1. Verify your result using factor theorem.

**Q.26** Show that $a^3 + b^3 + c^3 - 3abc = \dfrac{1}{2}(a+b+c)\left[(a+b)^2 + (b-c)^2 + (c-a)^2\right]$

Q. 27 For spreading the message "Save environment Save future" a rally was organized by some students of a school. They were given triangular cardboard piece ABC which they divided in to two parts by drawing the angle bisectors BO and CO of base angles B and C. Prove that $\angle BOC = 90 + \dfrac{1}{2}\angle A$. what is the benefit of these types of rallies?

Q.28 Solve the equation a − 35=75 and state which axiom you use here. Also give two more axioms other than the axiom used in the above situation.

Q.29 In the figure, two straight lines PQ and RS intersect each other at O. If $\angle POT = 75°$, find the values of a, b and c.
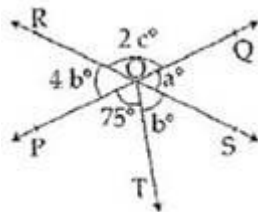
Q.30 In the given figure, prove that $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 360°$
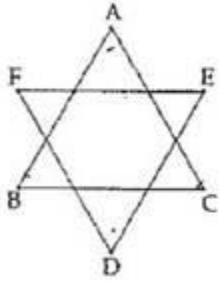
Q.31 The angles of a triangle are $(x-40)°, (x-20)°$ and $\left(\frac{x}{2}-10\right)°$. Find the value of x and then the angles of the triangle.