Sample Paper

Term - I

Time : 3Hrs. **MM : 90**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper consists of 34 questions divided into 4 sections. A, B, C and D. Section - A comprises of 8 questions of 1 mark each. Section - B comprises of 6 questions of 2 marks each. Section - C comprises of 10 questions of 3 marks each and Section - D comprises of 10 questions of 4 marks each.

(iii) Question numbers 1 to 8 in section-A are multiple choice questions where you are to select one correct option out of the given four.

(iv) There is no overall choice. However, internal choice has been provided in 1 question of two marks. 3 questions of three marks each and 2 questions of four marks each. You have to attempt only of the alternatives in all such questions.

(v) Use of calculator is not permitted.

Q.1 Which of the following is an irrational number?

(a) 3.14 (b) $3.\overline{14}$ (c) $3.1\overline{4}$ (d) 3.141141114

Q.2 The zeros of the polynomial $p(x) = x^2 + x - 6$ are

(a) 2,3 (b) -2, 3 (c) 2,-3 (d) -2, -3

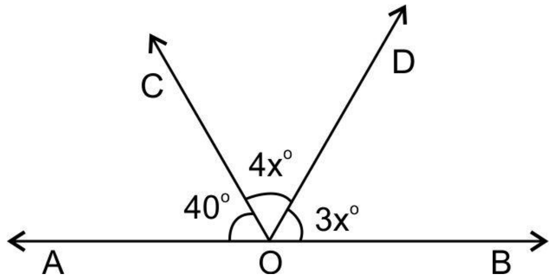
Q.3 The value of k, for which the polynomial $x^3 - 3x^2 + 3x + k$ has 3 as its zero, is

(a) -3 (b) 9 (c) -9 (d) 12

Q.4 When $(x^{31} + 31)$ is divided by $(x + 1)$, the remainder is

(a) 0 (b) 1 (c) 30 (d) 31

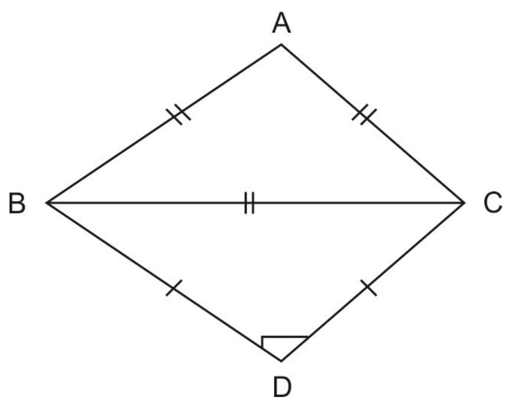
Q.5 In the given figure, AOB is a straight line. If $\angle AOC = 40^0, \angle COD = 4x^0$ and $\angle BOD = 3x^0$ then $\angle COD =$



(a) 80^0 (b) 100^0 (c) 120^0 (d) 140^0

Q.6 In the figure ABC is an equilateral triangle and BDC is an isosceles right triangle, right angled at D, $\angle ABD$ equals.

(a) 45^0 (b) 60^0 (c) 105^0 (d) 120^0



Q.7 The perimeter of an equilateral triangle is 60m. The area is

(a) $100\sqrt{3}\, m^2$ (b) $10\sqrt{3}\, m^2$ (c) $15\sqrt{4}\, m^2$ (d) $20\sqrt{3}\, m^2$

Q.8 In a ΔABC it is given that base = 12cm and height = 5cm its. area is

(a) $60cm^2$ (b) $30\ cm^2$ (c) $15\sqrt{3}\ cm^2$ (d) $45\ cm^2$

Section - B

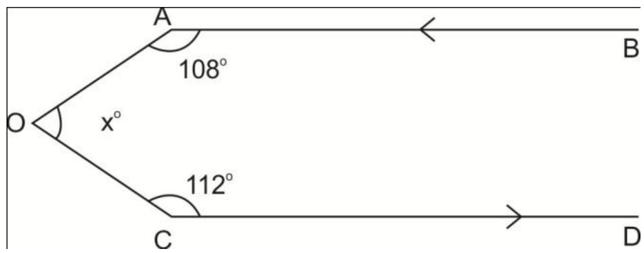
Question numbers 9 to 14 carry 2 marks each.

Q.9 Express $0.\overline{36}$ as a fraction in simplest form.

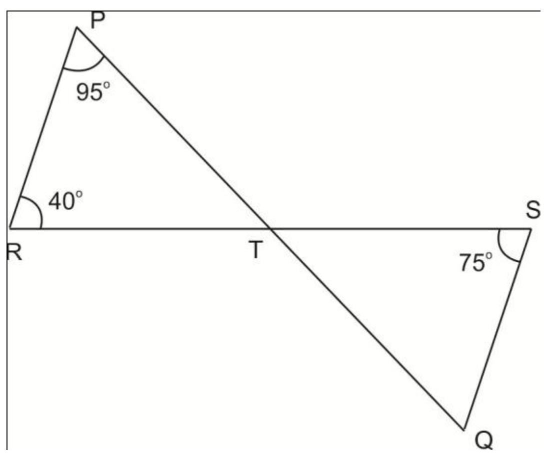
Q.10 If $2x + 3y = 13$ and $xy = 6$ find the value of $8x^3 + 27y^3$

Q.11 Locate $\sqrt{5}$ on the number line.

Q.12 Find the value of x in the adjoining figure if AB||CD.



Q.13 In the given figure if lines PQ and RS intersect at point T such that $\angle PRT = 40^0$ $\angle RPT = 95^0$ and $\angle TSQ = 75^0$ find $\angle SQT$



OR

The exterior angles, obtained on producing the base of a triangle both ways are 104^0 and 136^0. Find all the angles of the triangle.

Q.14 In which quadrant will the point lie, if

(i) The y coordinate is 3 and x coordinate is -4?

(ii) The x coordinate is -5 and the y coordinate is -4?

Section - C

Question numbers 15 to 24 carry 3 marks each.

Q.15 Find three rational numbers lying between $\frac{1}{5}$ and $\frac{1}{4}$

Q.16 Rationalize the denominator of $\frac{6}{3+\sqrt{2}}$

Q.17 Factorise $27x^3 + y^3 + z^3 - 9xyz$.

OR

Verify $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$

Q.18 Using factor theorem, show that $x + 5$ is a factor of $(2x^3 + 9x^2 - 11x - 30)$

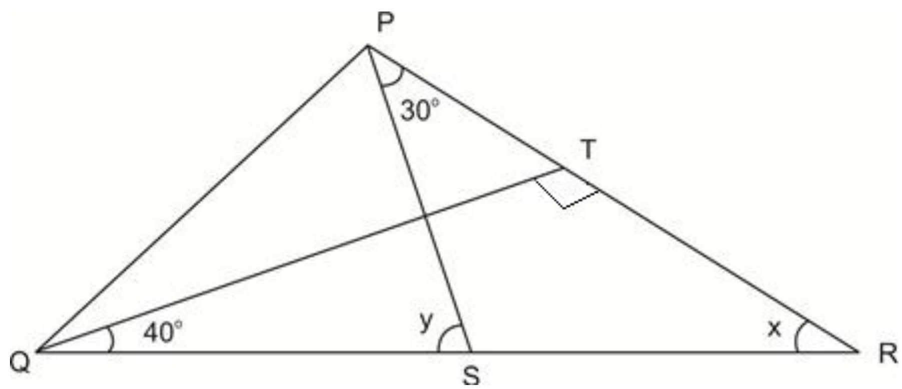
Q.19 If a point C lies between two points A and B such that AC=CB then prove that $AC = \frac{1}{2}AB$. Explain by drawing figure.

Q.20 Prove that sum of the angles of a triangle is 180^0.

OR

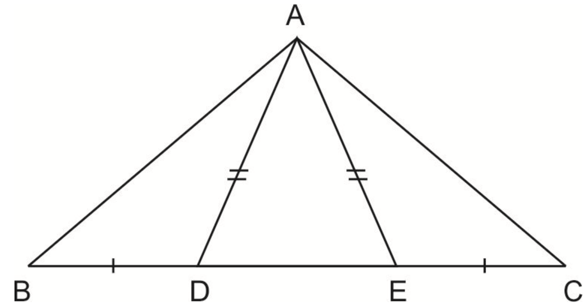
Prove that angles opposite to equal sides of a triangle are equal.

Q.21 In the given figure if $QT \perp PR,\ \angle TQR = 40^0\ and\ \angle SPR = 30^0$ find x, y



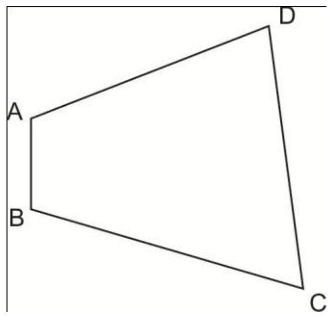
Q.22 ΔABC is an isosceles triangle with AB = AC side BA is produced to D such that AB = AD Prove that $\angle BCD$ is a right angle.

Q.23 D and E are points on side BC of ΔABC such that BD = CE and AD = AE. Show that $\Delta ABD \cong \Delta ACE$



OR

In figure AB and CD are respectively the smallest and the longest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$



Q.24 Find the area of a triangle, two sides of which are 8cm and 6cm and the perimeter is 24cm.

Section - D

Question number 25 to 34 carry 4 marks each.

Q.25 Simplify $\left(\frac{64}{125}\right)^{-2/3} + \left(\frac{256}{625}\right)^{-1/4} + \left(\frac{3}{7}\right)^{0}$

Q.26 Represent $\sqrt{9.3}$ on the number line

OR

Visualise $4.\overline{26}$ on the number line upto 4 decimal places.

Q.27 Find the value of a if $x + a$ is a factor of $p(x) = x^3 + ax^2 - 2x + a + 4$

Q.28 Using factor theorem factorize the polynomial $x^3 - 6x^2 + 11x - 6$

Q.29 Expand using suitable Identity.

(i) $(2x + 3y + 2z)^2$

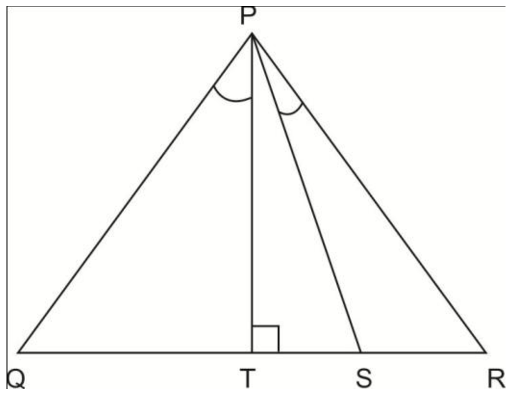
(ii) $\left[\frac{3}{2}x + 1\right]^3$

OR

Without finding the cubes, factorise and find the value of $\left(\frac{1}{4}\right)^3 + \left(\frac{1}{3}\right)^3 - \left(\frac{7}{12}\right)^3$

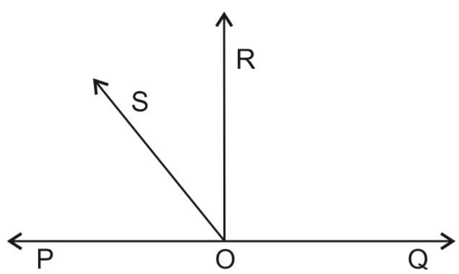
Q.30 Write any two Euclid's postulates and two axioms.

Q.31 In the given figure $PT \perp QR$ and PS bisects $\angle QPR$. If $\angle Q = 75^0$ and $\angle R = 32^0$ find $\angle TPS$

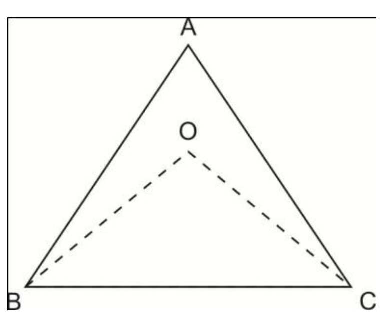


Q.32 In the figure given below POQ is a line ray OR is perpendicular to line PQ; OS is another ray lying between rays OP and OR prove that

$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$



Q.33 In the figure the bisectors of $\angle ABC$ and $\angle BCA$ intersect each other at the point O. Prove that $\angle BOC = 90^0 + \frac{1}{2}\angle A$



Q.34 Plot the point (1,2), (3,-4), (-4,-7) and (-2,2) on the graph paper.

Sample Paper SA -1

Marking Scheme

Section - A

Q.1	(d)	Q.2	(c)	Q.3	(c)	Q.4	(c)
Q.5	(a)	Q.6	(c)	Q.7	(a)	Q.8	(b)

Q.9 Let $y = 0.\overline{36}$ ---------(i)

$100y = 36.\overline{36}$ ---------- (ii)

Subtracting (i) from (ii)

100y - y = 36 - 0

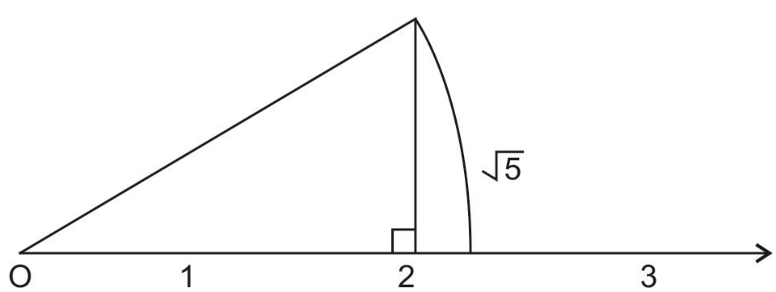
$y = \frac{4}{11}$

Q.10 $8x^3 + 27y^3 = (2x + 3y)(4x^2 + 9y^2 - 6xy)$

= $(2x + 3y)[(2x + 3y)^2 - 18xy]$

= $13\ [169 - 108] = 793$

Q.11 $\sqrt{5} = \sqrt{2^2 + 1^2}$



Q.12 Draw OE||AB

then OE||CD

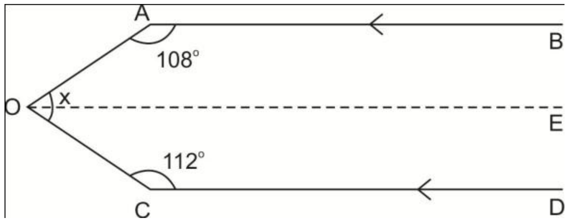
AB||OE

$108 + \angle AOE = 180^0$ (angle on same side of transversal)

$\angle AOE = 72^0$

$\angle EOC = 68^0$

$x = 140^0$

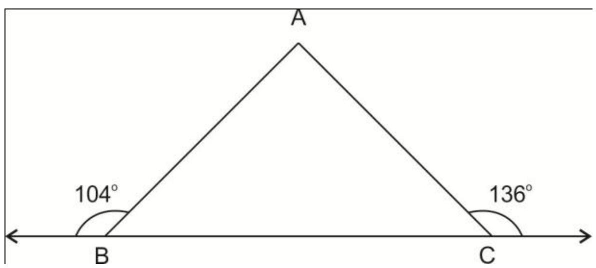


Q.13 $\angle PTR = 180^0 - (95^0 + 40^0)\ equals\ to\ 45^0$

$\angle STQ = 45^0$

$\angle SQT = 180^0 - (45^0 + 75^0) equals\ to\ 60^0$

OR



$\angle ABC = 76^0,\ \angle ACB = 44^0, \angle BAC = 180^0 - (76^0 + 44^0) = 60^0$

Q.14 (i) (-4,3) II quadrant (ii) (-5,-3) III quadrant

Q.15 $\frac{1}{5} and \frac{1}{4}$

$\frac{1 \times 4}{5 \times 4}\ and\ \frac{1 \times 5}{4 \times 5}$

and so on

Q.16 $\frac{6}{3+\sqrt{2}} \times \frac{3-\sqrt{2}}{3-\sqrt{2}}$

$\frac{6\,(3-\sqrt{2})}{7}$

Q.17 $27x^3 + y^3 + z^3 - 9xyz$

= $(3x)^3 + y^3 + z^3 - 3 \quad 3x.y.z$

= $(3x + y + z)(9x^2 + y^2 + z^2 - 3xy - yz - 3zx)$

Q.18 $x = -5$ $using\ factor\ theorem\ we$ get value p(x) = 0

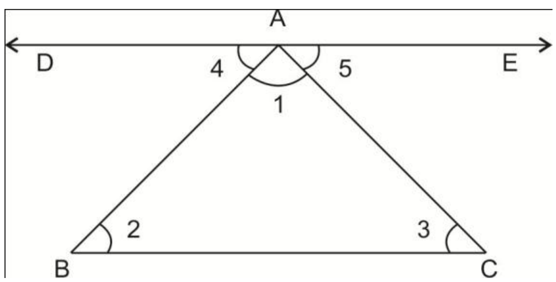
so x +5 is a factor of $2x^3 + 9x^2 - 11x - 30$

Q.19 AC + CB = AB

2AC = AB

AC = $\frac{1}{2}AB$

Q.20



Given - A triangle ABC

To Prove $\angle 1 + \angle 2 + \angle 3 = 180^0$

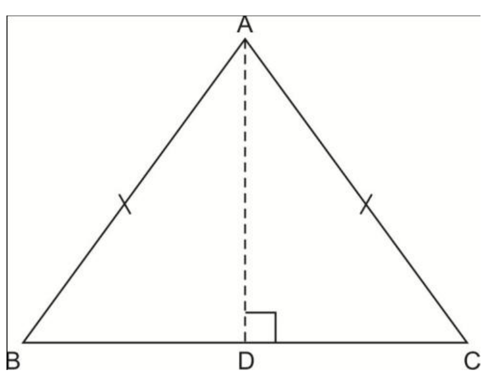
Construction : draw a line $DE||BC$

Proof : by figure $\angle 2 = \angle 4,\ \angle 3 = \angle 5$

So $\angle 2 + \angle 3 = \angle 4 + \angle 5$, $\angle 1 + \angle 2 + \angle 3 = \angle 1 + \angle 4 + \angle 5$

So $\angle 1 + \angle 2 + \angle 3 = 180^0$

OR



Given AB = AC

To Prove : $\angle C = \angle \mathrm{B}$

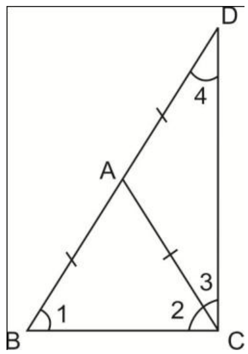
Construction : Draw the bisector AD of $\angle A$

Proof : In triangles ABD and ACD

AB = AC (given), $\angle BAD = \angle DAC,\ AD = AD$ So $\Delta ABD \cong \Delta ADC\ Hence\ \angle B = \angle C$

Q.21 $x = 50^0,\ y = 80^0$

Q.22.



$\angle 1 = \angle 2,\ \angle 4 = \angle 3$ So $\angle 1 + \angle 4 = \angle 2 + \angle 3$

In ΔBCD

$\angle 1 + \angle 2 + \angle 3 + \angle 4 = 180^0,\ 2(\angle 2 + \angle 3) = 180^0,\ \angle 2 + \angle 3 = 90^0$

Q.23 In ΔADE

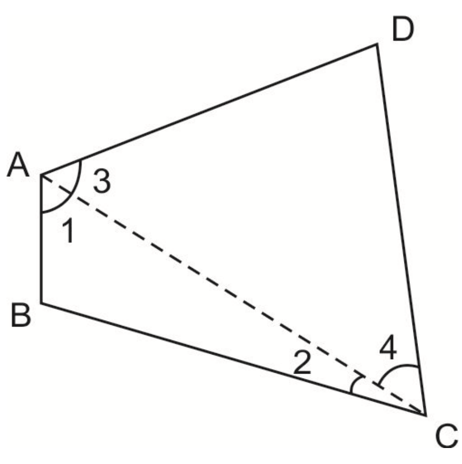
AD = AE

$\angle ADE = \angle AED,\ \angle ADB = \angle AEC$

In ΔABD & ΔACE

AD = AE, BD = CE, $\angle ADB = \angle AEC$ So $\Delta ABD \cong \Delta ACE$

OR



In ΔABC

$\angle 1 > \angle 2$

In $\Delta ADC,\ \angle 3 > \angle 4,\ So\ \angle 1 + \angle 3 > \angle 2 + \angle 4\ ,\ So\ \angle A > \angle C$

Q.24 Third side of triangle = 10 cm

$S = 12cm$

$A = \sqrt{s(s-a)(s-b)(s-c)}$

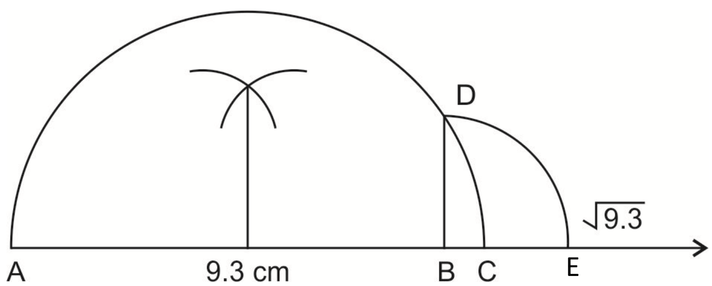
$\sqrt{12 \times 4 \times 6 \times 2} = 24cm^2$

Q,25 $\frac{4^{-2}}{5^{-2}} + \frac{4^{-1}}{5^{-1}} + 1$

$\frac{5^2}{4^2} + \frac{5}{4} + 1$

= $\frac{61}{14}$

Q.26



BD=BE=√9.3

Q.27 $P(-a) = 0$

$-a + 4 = 0$

$a = 4$

Q.28 Let $p(x) = x^3 - 6x^2 + 11x - 6$

$p(1) = 0$

$(x-1) is\ factor$ of $p(x)$

Now divide $p(x)\ by\ x - 1\ we\ get\ x^2 - 5x + 6$ as other factor now factorise this we get $(x-2) and\ (x-3) as\ other\ facotrs$.

Q.29 (i) $\{(2x)^2 + (3y)^2 + (2z)^2 + 2 \times 2x \times 3y + 2 \times 3y \times 2z + 2 \times 2x \times 2z\}$

= $4x^2 + 9y^2 + 4z^2 + 12xy + 12yz + 8xz$

(ii) $\left(\frac{3}{2}x\right)^3 + (1)^3 + 3 \times \left(\frac{3}{2}x\right)^2 \times 1 + 3 \times \frac{3}{2}x \times 1^2$

= $\frac{27}{8}x^3 + 1 + \frac{27}{4}x^2 + \frac{9x}{2}$

OR

If a + b + c = 0 then $a^3 + b^3 + c^3 = 3abc$

= $3 \times \frac{1}{4} \times \frac{1}{3} \times \frac{-7}{12} = \frac{-7}{48}$

Q.30 (i) If equals are added to equals the wholes are equal.

(ii) The whole is greater than the part.

Postulates (i) A terminated line can be produced indefinitely.

(ii) All right angles are equal to one another.

Q.31 $\angle QPR = 180^0 - (75^0 + 32^0) = 73^0$

$\angle QPS = 73 \times \frac{1}{2} = 36.5^0$

$\angle QPT = 15^0,\ \angle TPS = 21.5^0$

Q.32 $\angle ROQ = 90^0,\ \angle ROS + \angle SOP = \angle ROQ$

$\angle ROS + \angle ROS = \angle ROQ + \angle ROS - \angle SOP$

So $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$

Q.33 In $\Delta\ OBC$

$\angle OBC + \angle OCB + \angle BOC = 180^0$

$\angle OBC + \angle OCB = 180^0 - \angle BOC$

$\Delta\ ABC,\ \frac{1}{2}(\angle A + \angle B + \angle C) = 90^0$

So, $\frac{1}{2}(\angle B + \angle C) = 90^0 - \frac{1}{2}\angle A$

So, $180^0 - \angle BOC = 90^0 - \frac{1}{2}\angle A$

$\angle BOC = 90^0 + \frac{1}{2}\angle A$

Q.34