ANSWERS - SECTION A

1) $\left(\frac{7^{-4}}{4^{-2}}\right)^{1/4} = \left(\frac{4^2}{7^4}\right)^{1/4}$ $\left[\because x^{-n} = \frac{1}{x^n}\right]$

$= \frac{4^{2\times\frac{1}{4}}}{7^{4\times\frac{1}{4}}}$ $(x^m)^n = x^{mn}$

$= \frac{4^{1/2}}{7}$

$= \frac{2^{2\times\frac{1}{2}}}{7}$

$= \frac{2}{7}$ Ans.

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2) Using the identity when $a+b+c=0$,
then $a^3+b^3+c^3 = 3abc$

$\therefore$ when $a^{1/3}+b^{1/3}+c^{1/3} = 0$
then $a+b+c = 3a^{\frac{1}{3}}\cdot b^{\frac{1}{3}}\cdot c^{\frac{1}{3}}$

option (b) is correct.

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3) According to given information point P is $(0,-6)$

$\therefore$ $P(0,-6)$

on y-axis x is zero

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4) $x + 4 = 10$

$x + 4 - 4 = 10 - 4$

$x = 6$

$\Rightarrow$ If equals are subtracted from equals, the remainder are equal.

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5) Number of times batsman hit sixes = 8

Number of times batsman didn't hit six = 32 − 8

= 24

Probability $P(E) = \frac{24}{32}$

$= \frac{3}{4}$ ans.

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6) Total angle at centre = 360°

When divided into eight parts,

Angle subtended by each arc $= \frac{360}{8}$

$= 45°$ ans.

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7) $\sqrt{2}$, 0.2020020002 , π are irrational number since they are non-terminating and non-repeating

$0.534\,534\,534\ldots = 0.\overline{534}$ is non-terminating & Repeating

There is a rational number.

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8) The highest power of the variable is known as degree of polynomial.

$$\sqrt{2} = \sqrt{2}x^0$$

hence degree of polynomial is zero. Ans.

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9) The y-axis coordinate is called ordinate.
Just as x-axis coordinate is called abscissa.
Y coordinate is always mentioned second.

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10) Euclid's axioms :

(i) Things which are equal to the same thing are equal to one another. e.g. $\overrightarrow{AB} = \overrightarrow{PQ}$ & $\overrightarrow{PQ} = \overrightarrow{XY}$ then $\overrightarrow{AB} = \overrightarrow{XY}$

(ii) If equals are added to equals, the whole are equal.
e.g. $x - 15 = 25$

$$x - 15 + 15 = 25 + 15$$

$$x = 40.$$

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11) Events with probability 1
(i) Sun will rise in the east.
this has probability 1 because its a sure event as sun will only rise in the east.

Events with probability 0
(i) Sun will rise in west.
this has probability 0 because its an impossible event.

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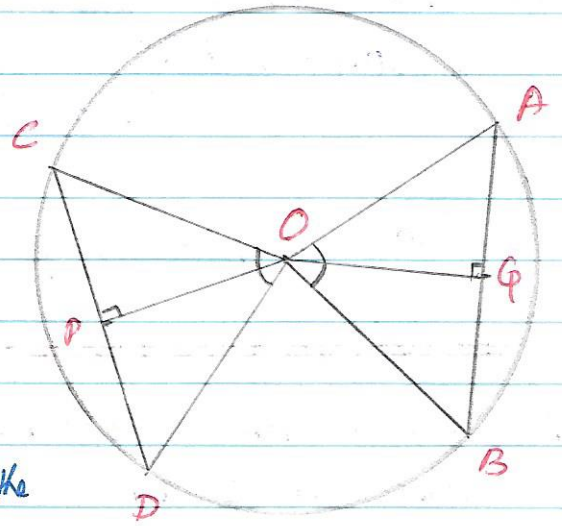
12) $\angle AOB = 110°$
$\angle COD = 110°$
$AB = 8$ cm
} Given



$\angle AOB = \angle COD = 110°$ (Given)

According to theorem 10.2,
"If the angle subtanted by the chords of a circle at the centre are equal, then the chords are equal".

$\therefore AB = CD = 8$ cm.

Given $OP \perp CD$.

According to theorem 10.3,
"The perpendicular from the centre of a circle to the chord bisects the chord"

$$\therefore CP = \frac{CD}{2} = \frac{8}{2} = 4 \text{ cm}$$

$\therefore$ $\underline{CP = 4 \text{ cm}}$ Ans.

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13) No, pie is not a rational number because the actual value of pie is 3.14..... it's non terminating and non-repeating decimal. $\frac{22}{7}$ is the estimate value of pie.

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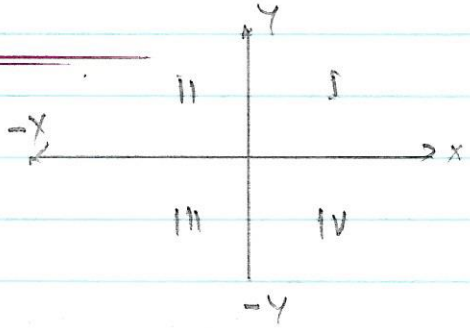
14) A polynomial consisting of only one term, namely zero only, is called zero polynomial.
e.g. 0 (zero). The degree of zero polynomial is not defined.

15) $P(2,-3)$ – 4th quadrant

$Q(-3,2)$ – 2nd quadrant.

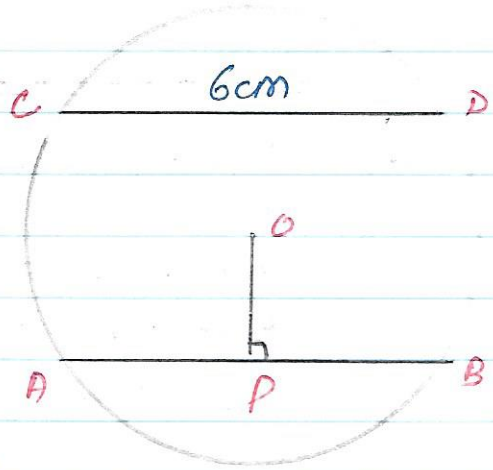


16) Point: A point in geometry is a location. It has no size i.e. no width, no length and no depth. A point is shown by dot.

A line: A line is defined as a line of points that extends infinitely in two direction. It has one dimension, length.

17) 7/6 can not be an empirical probability because probability always lies between 0 and 1.

18) CD = 6 cm



According to theorem 10.7,
"Chords equidistance from the center of a circle are equal in length."

$\therefore$ CD = AB = 6 cm

$\therefore$ $PB = \frac{AB}{2} = \frac{6}{2} = 3$ cm

$\therefore$ PB = 3 cm Ans

19) $p(x) = x^2 - 4x + 3$

$p(-1) = (-1)^2 - 4(-1) + 3$

$= 1 + 4 + 3$

$p(-1) = 8$

$p(\frac{1}{2}) = (\frac{1}{2})^2 - 4(\frac{1}{2}) + 3$

$= \frac{1}{4} - 2 + 3$

$= \frac{1}{4} + 1$

$= \frac{5}{4}$

$\therefore p(-1) - p(\frac{1}{2}) = 8 - \frac{5}{4}$

$= \frac{32 - 5}{4}$

$= \frac{27}{4}$ Ans.

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20) Given linear equation $7 - 2x + 4y = 0$

on y-axis, $x = 0$

$\therefore 7 - 2 \times 0 + 4y = 0$

$7 + 4y = 0$

$y = \frac{-7}{4}$ Ans. $\left(0, -\frac{7}{4}\right)$

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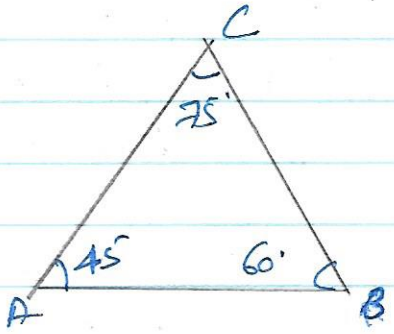
21) $\angle A = 45$ & $\angle B = 60$

$\angle A + \angle B + \angle C = 180$

$45 + 60 + \angle C = 180$

$\angle C = 75°$



$BC < AC < AB$.

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22) $0.328 = \frac{328}{1000}$ in the form of p/q.

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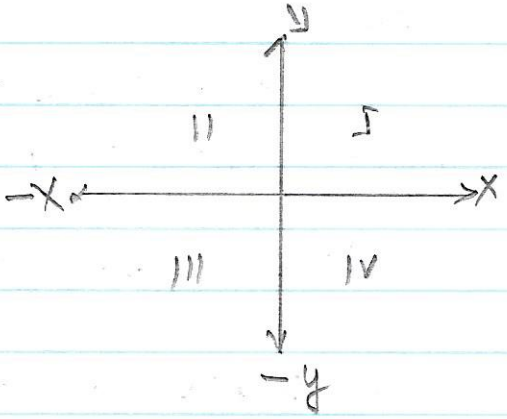
23) $(-4,2)$ – 2nd quadrant

$(3,-2)$ – 4th quadrant

$(-4,-5)$ – 3rd quadrant

$(0,-7)$ – on y axis between III & IV



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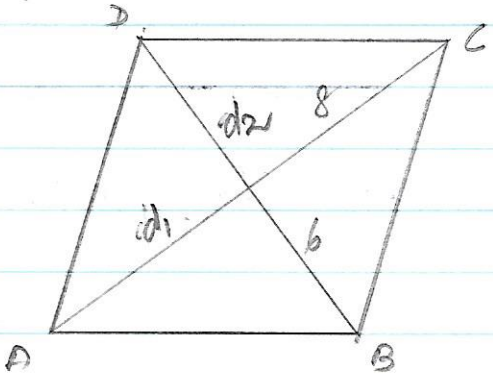
24) Area of rhombus $= \frac{1}{2} d_1 d_2$

$\frac{1}{2} d_1 \times d_2 = 96 \text{ cm}^2$

$\frac{1}{2} \times 16 \times d_2 = 96$

$d_2 = \frac{96 \times 2}{16}$

$d_2 = 12 \text{ cm}$



Side $= \sqrt{8^2+6^2} = \sqrt{64+36} = \sqrt{100}$

Sides = 10 cm Ans.

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25) Given data: 40, 70, 65, 70, 75, 95, 100 & 50

Arranging data in ascending order:

40, 50, 65, (70, 70,) 75, 85, 100

Median $= \frac{70+70}{2} = 70$ Ans.

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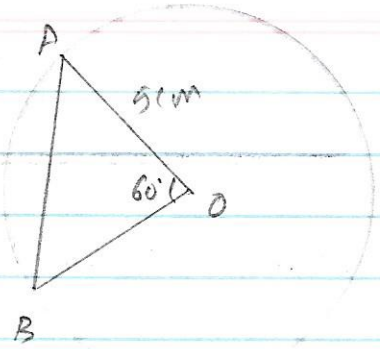
26) $OA = OB = 5\text{ cm}$ (Radius)



Since $OA = OB$

$\therefore \angle OAB = \angle OBA$

(Angles opposite to equal sides.)

$\angle OAB = \angle OBA = 60°$ [Using angle sum property of triangle]

$\therefore$ $\triangle AOB$ is a equilateral triangle.

$\therefore$ $OA = OB = AB = 5\text{cm}$

$\therefore$ $AB = 5\text{cm}$ Ans.

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27) Class mark $= \dfrac{\text{Upper limit} + \text{lower limit}}{2}$

$= \dfrac{130 + 150}{2}$

$= 140$ Ans.

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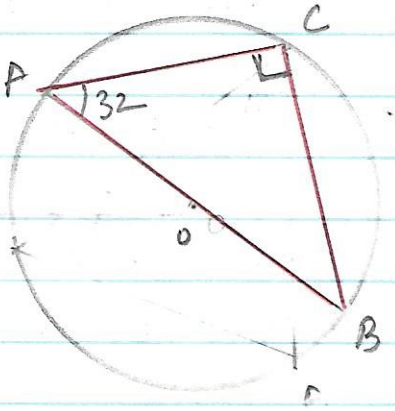
28) Angle in semi-circle is $90°$



$\therefore$ $\angle A + \angle C + \angle B = 180$

$32 + 92 + \angle B = 180$

$\angle B = 58$

$\therefore$

$\angle ABC = 58°$ Ans.

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29) Degree of polynomial is 3

30) $p(x) = 2x^3 + ax + \sqrt{2}$

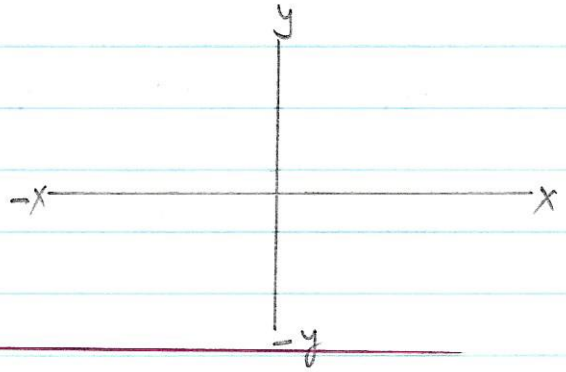
$p(1) = 0$

$\therefore 2(1)^3 + a(1) + \sqrt{2} = 0$

$2 + a + \sqrt{2} = 0$

$a = -(2+\sqrt{2})$

31) Coordinate . $(-5, 0)$



32) Given $x = 3y$

$x - 3y + 0c = 0$

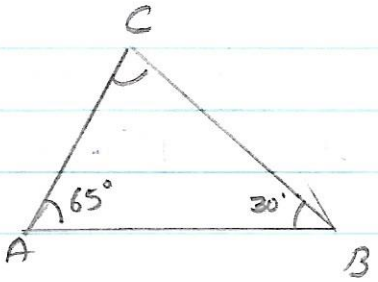
$a = 1 \quad b = -3 \quad c = 0 \quad [\, ax + by + c = 0 \,]$

33) $\angle A = 65^\circ \quad \angle B = 30^\circ$

$\angle A + \angle B + \angle C = 180^\circ$

$65 + 30 + \angle C = 180^\circ$

$\angle C = 85$



AB is the longest side, since $\angle C$ is greatest.

[$\because$ Side opposite to the largest angle is greatest.]

34) Curved surface area $= \pi r l$

$l = 10\ cm$ (Slant Height)

$r = 7\ cm$ (Radius)

$A = \frac{22}{7} \times 7 \times 10\ cm^2$

$A = 220\ cm^2$ Ans

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35) Total surface area of cube $= 6\ (edge)^2$

$= 6a^2$

$6a^2 = 726$

$a^2 = \frac{726}{6}$

$a^2 = 121$

$a = \sqrt{121}$

$= \sqrt{11 \times 11}$

$a = 11\ cm$

Side $= 11\ cm$ Ans.

$6)726(121$
6
12
12
06
6
1

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36) $y^2 - 8y + 16 = y^2 - 4y - 4y + 16$

$= y(y-4) - 4(y-4)$

$= (y-4)(y-4)$

(or)

Using identity $(a-b)^2 = a^2 + b^2 - 2ab$

$a = y \quad b = 4 \quad 2ab = 2 \cdot y \cdot 4 = 8y$

$\therefore y^2 - 8y + 16 = y^2 - 2 \cdot y \cdot 4 + (4)^2$

$= (y-4)^2$

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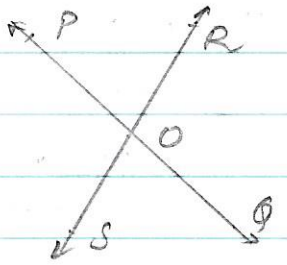
37) Vertically opposite angles

$\angle POR$, $\angle SOQ$ & $\angle POS$, $\angle ROQ$



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38) Prime numbers are 2, 3 & 5.

∴ Probability of getting a prime number

$$= \frac{\text{Total favourable events}}{\text{Total event}}$$

$$= \frac{3}{6}$$

$$= \frac{1}{2} \text{ Ans.}$$

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39) $\sqrt{5}$ is a irrational number because it is non-terminating and non-repeating.

40) $AB = AC$ (Given)

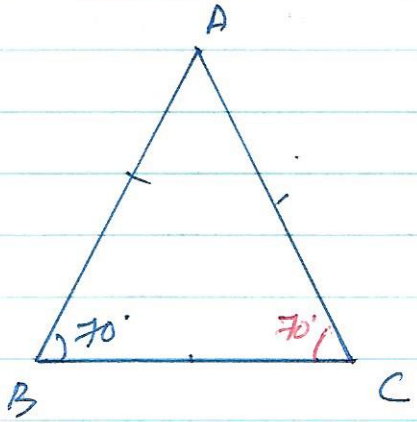
$\angle B = \angle C = 70$ [$\because AB = AC$]

$\angle A + \angle B + \angle C = 180$ [Angle sum property]

$\angle A = 180 - (70 + 70)$

$= 180 - 140$

$\angle A = 40°$ Ans.



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41) Rational number between $\sqrt{5}$ & $\sqrt{7}$ is $\frac{25}{10} = \frac{5}{2}$

42) Degree of $4x^4 + 5x + 7$ is 4.

43) It is isosceles triangle.

44) Let the interior opposite angle be x

Using the exterior angle property $105 = x + x$

$$2x = 105$$
$$x = \frac{105}{2} = 52.5.$$

45) $125^x = \frac{25}{5^x} \Rightarrow 5^{3x} = \frac{5^2}{5^x}$

$$5^{3x} = 5^{2-x}$$

Equating coefficients $3x = 2 - x$

$$4x = 2$$
$$x = \frac{1}{2} \text{ Ans.}$$

46) Since $AO \perp OB$ $\therefore (2x - 5) + (x - 10) = 90$

$$3x - 15 = 90$$
$$3x = 90 + 15$$
$$3x = 105$$
$$x = 35$$

$$\angle BOC = x - 10 = 35 - 10$$
$$= 25^\circ \text{ Ans}$$

47) Irrational number between 2.3 and 2.5 is 2.30100010001...

48) $p(x) = x^2 - 2\sqrt{2}x + 1$

$p(2\sqrt{2}) = (2\sqrt{2})^2 - 2\sqrt{2} \times 2\sqrt{2} + 1$

$= 4 \times 2 - 4 \times 2 + 1$

$p(2\sqrt{2}) = 1$ Ans.

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49) $\frac{1}{\sqrt{7}-2} = \frac{\sqrt{7}+2}{(\sqrt{7}-2)(\sqrt{7}+2)}$

$= \frac{\sqrt{7}+2}{(\sqrt{7})^2 - (2)^2}$ $\quad [a^2 - b^2 = (a+b)(a-b)$

$= \frac{\sqrt{7}+2}{7-4}$

$= \frac{2+\sqrt{7}}{3}$

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50) $x + 2 = 0$

51) A line parallel to the x-axis is one that has the same value of y for all values of x.

As the line required passes through $(3, -4)$,
y has to be equal to -4

$\therefore y = -4$

$y + 4 = 0$ Ans.

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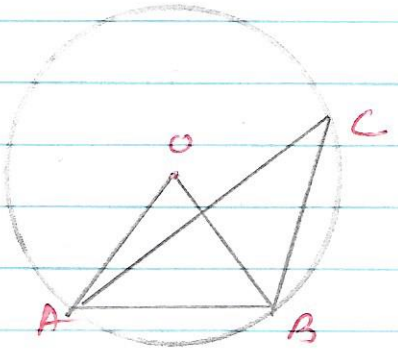
55) As angle subtended in semi-circle is 90°

$\therefore$ in $\triangle ABC$, $\angle B + \angle C + \angle A = 180°$

$$35 + 90 + x = 180°$$
$$x = 180 - 135$$
$$x = 55° \text{ Ans.}$$

52) Since $\triangle AOB$ is a equilateral triangle.

$\therefore \angle AOB = 60°$



and $\angle ACB = \frac{60}{2} = 30°$

[$\because$ According to theorem 10.8, The angle subtended by the arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.]

53) $\left(\frac{1}{27}\right)^{-\frac{2}{3}} = (27)^{\frac{2}{3}} = (3^3)^{2/3} = 3^{3 \times \frac{2}{3}} = 3^2 = 9$. Ans.

54) When parallelogram is on the same and located between the same parallel then its area will be equal. It is given rhombus and square are two parallelograms on same base and located between the same parallels.

$\therefore$ area of rhombus = area of square

$\therefore$

Ratio = 1 : 1 Ans