ANSWERS

Section - B

1) Given $(3x-4y)^3 = 27x^3 - 64y^3 + axy^2 + bx^2y$

$$(3x-4y)^3 = (3x)^3 - (4y)^3 + xy(ay+bx)$$

$$\cancel{(3x)^3} - \cancel{(4y)^3} - 3\cdot 3x\cdot 4y(3x-4y) = \cancel{(3x)^3} - \cancel{(4y)^3} + xy(ay+bx)$$

$$[\because (x-y)^3 = x^3 - y^3 - 3xy(x-y)$$

$$-36\cancel{xy}(3x-4y) = \cancel{xy}(ay+bx)$$

$$36(4y-3x) = ay+bx$$

$$\therefore 144y - 108x = ay + bx$$

Comparing coefficients,

$a = 144$

$b = -108$ Ans:

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2) $\frac{\sqrt{3}}{2}y = 3 \Rightarrow 0\cdot x + \frac{\sqrt{3}}{2}y - 3 = 0$

$a = 0 \quad b = \frac{\sqrt{3}}{2} \quad c = -3. \quad [\because ax+by+c=0]$

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3) Since $(2k-3, k+2)$ lies on $2x+3y+15=0$

$$\therefore 2(2k-3) + 3(k+2) + 15 = 0$$

$$4k - \cancel{6} + 3k + \cancel{6} + 15 = 0$$

$$7k = -15$$

$$k = \frac{-15}{7}$$ Ans

4) (a) There are two undefined terms, line and point.

They are consistent, because they deal with two different situations.

(b) (i) Says that given two points be R and S, there is a point T, lying on the line which is in between them.

(ii) Says that given R and S, we can take T not lying on the line passing through R and S.

These 'Postulates' do not follow from Euclid's postulates.

However, (ii) follow from given postulate (i).

5) Perimeter of floor $= 150$ m

Height, $h = ?$

Surface are of four walls $= 150h$ m^2

Cost of painting $1\ m^2$ $=$ Rs. 10

Cost of painting $150h\ m^2$ $=$ Rs $10 \times 150h$

$=$ Rs. $1500h$

But Rs $1500h =$ Rs 9000 (Given)

$\therefore h = \frac{90\cancel{00}}{15\cancel{00}}$

$h = 6$ m Ans.

6) No. of data = 14

Median = Mean of 7^{th} and 8^{th} term.

On increasing the 9^{th} term by 5 there will be no change in the median.

7) Given $6a^2 + a - 12$

$$12 \times 6 = 72 = 9 \times 8$$

$$\therefore \; 6a^2 + a - 12 = 6a^2 + 9a - 8a - 12$$

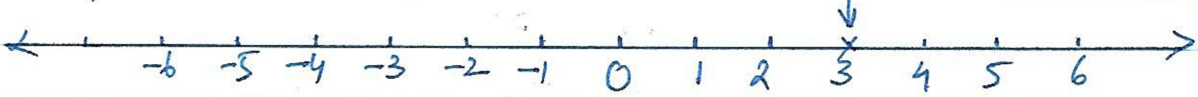
$$= 3a(2a+3) - 4(2a+3)$$

$$= (3a-4)(2a+3)$$

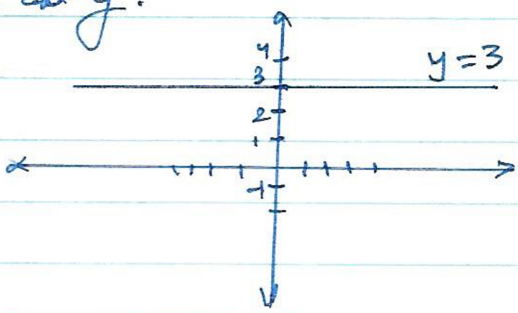
length and breadth are given by expression $(3a-4)(2a+3)$

8) Given, linear equation is $y = 3$

(i) If $y = 3$ is treated as an equation in one variable, then it has a unique solution $y = 3$. So it is a point on the number line.



(ii) Given equation $y = 3$ can be written as $0 \cdot x + y = 3$, which is a linear equation in two variables x and y.



9) Poin (3, 4) lies on $3y = ax + 7$

$\therefore 3 \times (4) = a(3) + 7$

$3a = 12 - 7$

$3a = 6$

$a = 2$ Ans

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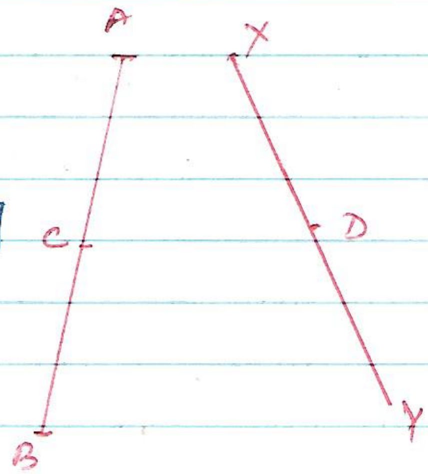
10) $AB = 2\,CB$ [$\because$ C is the mid-poin of AB.



$XY = 2\,XD$ [$\because$ D is the mid-poin of CD]

Also, $AC = XD$ (Given)

$\therefore AB = CD$

(Things which are double of the same thing are equal to one another)

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11) $L = 4m$ $W = 3m$ and $H = 2m$

Volume $= L \times W \times H = 4 \times 3 \times 2 \times m \times m \times m$

$= 24\ m^3$

$= 24{,}000L$ [$\because 1\ cm^3 = 1000\ L$]

12)

12) Given Mean of five number = 27

$$\text{Mean} = \frac{\text{Sum of observation}}{\text{Number of observation.}}$$

Sum of observation $= 27 \times 5$

$= 135$

Let the excluded number be x

New mean $= \frac{135 - x}{4}$

According to given condition

$$\frac{135 - x}{4} = 27 - 2 \quad [\text{Mean reduced by } 2]$$

$135 - x = 25 \times 4$

$135 - x = 100$

$x = 135 - 100$

$= 35$

Hence, the excluded number is 35.

13) $$\frac{454 \times 441 - 454 \times 21}{(877)^2 - (423)^2} = \frac{454\,(441 - 21)}{(877 + 423)\,(877 - 423)}$$

$$= \frac{\cancel{454} \times 42\cancel{0}}{130\cancel{0} \times \cancel{454}}$$

$$= \frac{\cancel{42}^{21}}{\cancel{130}\,65} = \frac{21}{65} \text{ ans.}$$

14) Find the value of k, if $x = 2$, $y = 1$ is solution of $2x + 3y = k$

$$2(2) + 3(1) = k$$

$$k = 4 + 3$$

$$\underline{\underline{k = 7}} \text{ Ans.}$$

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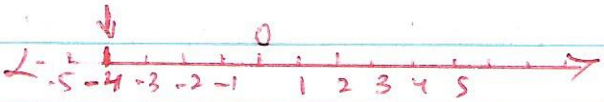
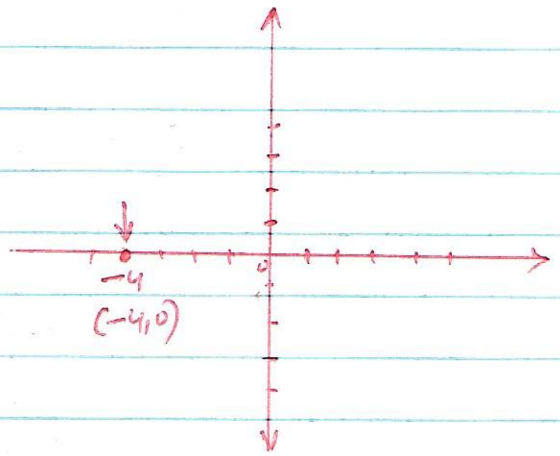
15. Given $2x + 1 = x - 3$

$$2x - x = -3 - 1$$

$$x = -4$$

$$x + 4 = 0$$





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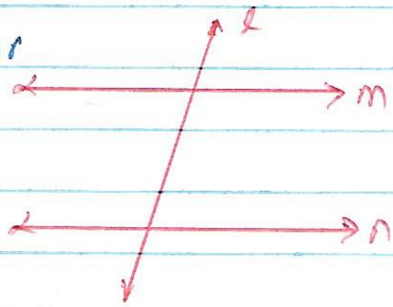
16) If a straight line l falls on the two straight lines m & n such that the sum of the interior angles on one side of l is two right angles, then by Euclid's fifth postulate the lines will not meet on the sides of l.

We know that the sum of the interior angles on the other side of line and will also be two right angles.



Hence, they will not meet on the other side also.

So the lines m & n never meet and are therefore parallel.

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17) Total surface area of cone $= \pi r l + \pi r^2$

$$TSA = \pi r (l + r)$$

$$= \pi \frac{r}{2}\left(2l + \frac{r}{2}\right)$$

$$= \pi r \left(\frac{4l + r}{2}\right)$$

$$TSA = \frac{\pi r}{2}(r + 4l)$$

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18) Given data : 17, 2, 7, 27, 5, 14, 18, 10

Arranging in ascending order

$$\underbrace{2, 5, 7}, 10, 14, \underbrace{17, 18, 27}$$

$$\text{Median} = \frac{10+14}{2}$$

$$= \frac{24}{2}$$

$= \underline{\underline{12}}$ Ans.

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19) (a) $(125)^{-1/3} = (5^3)^{-1/3} = 5^{-3 \times 1/3} = 5^{-1} = \underline{\underline{\frac{1}{5}}}$ Ans.

(b) $2^{1/4} \times 8^{1/4} = 2^{1/4} \times 2^{3/4} = 2^{\frac{1}{4}+\frac{3}{4}}$

$$= 2^{\frac{4}{4}}$$

$= \underline{\underline{2}}$ Ans.

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20) Things which are equal to the same things are equal to one another.

Anand saving = Raju saving, Anand saving = Pankaj saving

$\therefore$ Raju saving = Pankaj saving.

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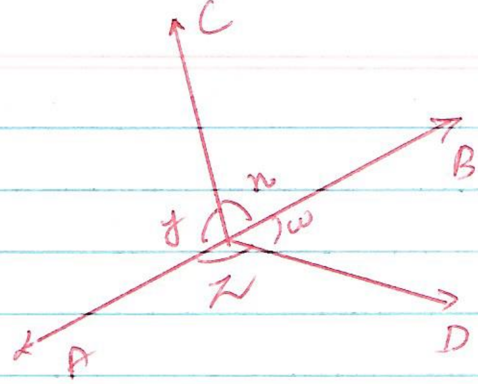
21) Given $x+y = w+z$

$x+y+y+z = 360°$

$\because x+y = y+z$

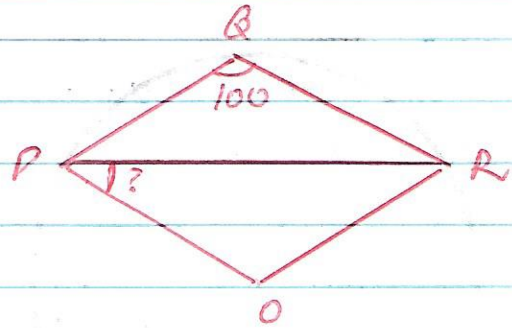
$\therefore 2(x+y) = 360°$

$x+y = 180°$



$\therefore$ AOB is straight line. [$\because$ linear pair]

22) $\angle PQR = 100$ (Given)



$\therefore \angle POR = 2 \times 100$ (External)

$= 200$

[$\because$ 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]

Now in ΔPOR, $\angle POR = 360 - 200$

$= 160°$

$\angle OPR + ORP + \angle POR = 180°$

$2\,OPR + 160 = 180$ [$\because OP = OR =$ Radius

$2OPR = 180 - 160$ $\therefore \angle OPR = \angle ORP$]

$= 20$

$\angle OPR = 10°$ Ans.

23) Wooden Box dimension $= 8 \times 7 \times 6 \times m^3$

Box dimen $= 8 \times 7 \times 6 \ cm^3$

No. of boxes carried in wooden Box

$$= \frac{\cancel{8} \times \cancel{7} \times \cancel{6}}{\cancel{8} \times 10^{-2} \times \cancel{7} \times 10^{-2} \times \cancel{6} \times 10^{-2}} \qquad [\because 1m = 100\ cm,\ 1cm = 10^{-2} m]$$

$= \underline{\underline{10^6}}$ Ans..

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24) Total number of wheat bags $= 11$

Number of bags having more than 5 kg $= 7$

No. of bags equal to 5 kg $= 2$

$\therefore$ Probability of bag contain more than 5 kg $= \frac{7}{11}$

Probability of bag contain equal to 5 kg $= \frac{2}{11}$

25.) Given data : 2, 3, 4, 5, 0, 1, 3, 3, 4, 3

Arraying in ascending order $\underline{0, 1, 2, 3,} 3, 3, \underline{3, 4, \cancel{4}, 5}$

$$\text{Mean} = \frac{0+1+2+3+3+3+3+4+4+5}{10}$$

$= \frac{28}{10}$

$= 2.8$

Mode : 3

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26) $a = 11\,m \quad b = 60\,m \quad \& \quad c = 61\,m$

$$s = \frac{11 + 60 + 61}{2}$$

$$= 66$$

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

$$s-a = 66 - 11 = 55$$
$$s-b = 66 - 60 = 6$$
$$s-c = 66 - 61 = 5$$

$$\therefore \quad A = \sqrt{66 \times 55 \times 6 \times 5}$$

$$= \sqrt{11 \times 6 \times 11 \times 5 \times 6 \times 5}$$

$$= \sqrt{11 \times 11 \times 6 \times 6 \times 5 \times 5}$$

$$A = 11 \times 6 \times 5$$

$$A = \underline{\underline{330\,m^2}} \text{ Ans.}$$

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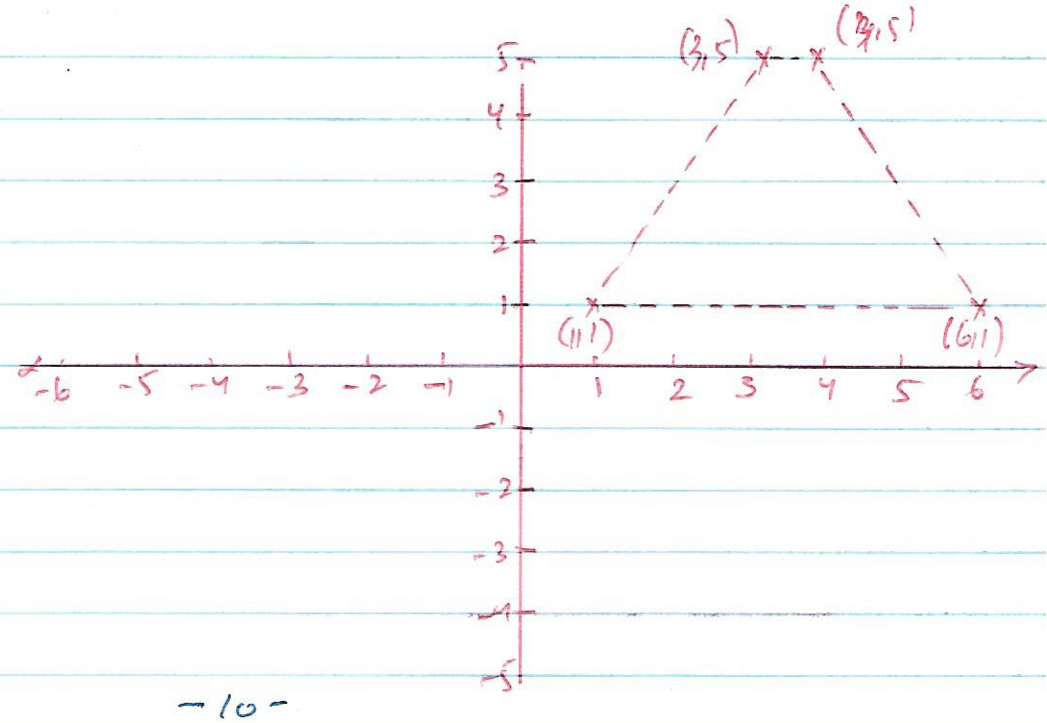
27) Trapezium.



28) $p+q = 12 \qquad pq = 27$

Using the identity $(a+b)^3 = a^3+b^3+3ab(a+b)$

$\therefore \quad p^3+q^3 = (p+q)^3 - 3pq(p+q)$

$= (12)^3 - 3\times 27\times 12$

$= 12[12\times12 - 3\times27]$

$= 12[144 - 81]$

$= 12\times 63$

$p^3+q^3 = \underline{\underline{756}}$ Ans.

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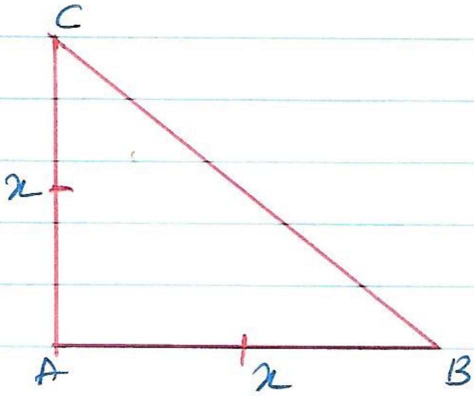
29) $AB = BC$



$\frac{1}{2}$ base $\times$ height $= 200$ cm^2
(Area of Triangle)

$\therefore \frac{1}{2}\times x\times x = 200$

$x^2 = 200\times2 = 400$

$x = 20$ cm

Hypotenuse $BC = \sqrt{x^2+x^2} = \sqrt{(20)^2+(20)^2}$

$= \sqrt{400+400}$

$= \sqrt{800}$

$= 10\sqrt{8}$

$= \underline{\underline{20\sqrt{2}}}$ Ans.