STD - 10th

Paper - 6

Maths Solution

Section - B

25) let, $p(s) = 4s^2 - 4s + 1$

let, $p(s) = 0$

$\therefore 4s^2 - 4s + 1 = 0$

$\therefore (2s)^2 - 2(2s)(1) + (1)^2 = 0$

$\therefore (2s - 1)^2 = 0$

$\therefore (2s-1)(2s-1) = 0$

$\therefore 2s - 1 = 0$ & $2s - 1 = 0$

$s = \frac{1}{2}$ $\quad$ $s = \frac{1}{2}$

→ The zeros of the $p(x)$ are $\frac{1}{2}$ and $\frac{1}{2}$

26) $x = -3$

$p(x) = x^3 + 12x^2 + ax + 60$

$\therefore p(-3) = (-3)^3 + 12(-3)^2 + a(-3) + 60$

$\therefore \quad 0 = -27 + 12 \times 9 = 3a + 60$

$\therefore \quad 3a = -27 + 108 + 60$

$\therefore \quad 3a = 168 - 27$

$\therefore \quad 3a = 141$

$\therefore \quad a = \frac{141}{3}$

$\therefore \boxed{a = 47}$

27) let the two consecutive positive integers be x and $x+1$

$x(x+1) = 306$

$x^2 + x = 306$

$\boxed{x^2 + x - 306 = 0}$

$\therefore \quad x^2 + 18x - 17x - 306 = 0$

$\therefore \quad x(x+18) - 17(x+18) = 0$

$\therefore (x+18)(x-17) = 0$

$x+18=0$ | $x-17=0$
$x=-18$ | $x=17$.

Two consecutive integers are 17 and 18

28). $a=7$
$d=3$
$n=8$
$a_8=(?)$

n^{th} term, $a_n=a+(n-1)d$

$\therefore a_8=7+(8-1)3$
$=7+(7)(3)$
$=7+21$

$\boxed{a_8=28}$

29). A.P. : $6, 12, 18, \dots\dots 240$

$a=6$
$d=6$
$a_n=240$

n^{th} term, $a_n=a+(n-1)d$

$\therefore 240=6+(n-1)(6)$
$240-6=(n-1)(6)$

$234=(n-1)6$

$$\frac{234}{6} = n-1$$

$$39 = n-1$$

$$39+1 = n$$

$$\boxed{40 = n}$$

Sum of n terms

$$S_n = \frac{n}{2}(a + a_n)$$

$$S_{40} = \frac{40}{2}(6+240)$$

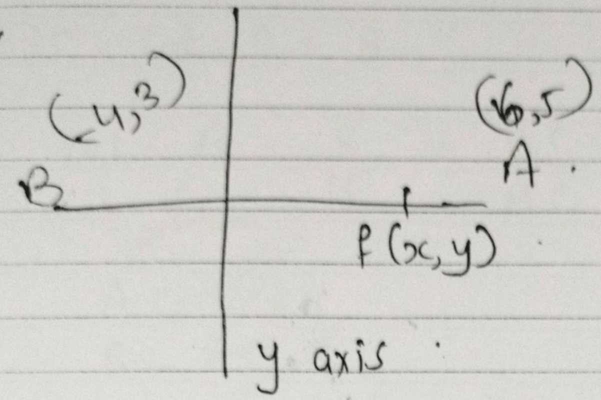
$$= 20(246)$$

$$\boxed{S_{40} = 4920}$$

ANS: sum of first 40 +ve integers

$$\boxed{4920}$$

30)



$A(6,5) = A(x, y)$
$B(-4,3) = B(x, y)$

$P(x, y) = P(0, y)$

→ P is at equidistant from A and B

$AP = BP$

$AP^2 = BP^2$

$(x_1 - x)^2 + (y_1 - y)^2 = (x_2 - x_1)^2 + (y_2 - y)^2$

$(6-0)^2 + (5-y)^2 = (-4-0)^2 + (3-y)^2$

$36 + 25 - 10y + \cancel{y^2} = 16 + 9 - 6y + \cancel{y^2}$

$61 - 10y = 25 - 6y$

$61 - 25 = 10y - 6y$

$\therefore 36 = 4y$

$\frac{36}{4} = y$

$\therefore \boxed{9 = y}$

ANS:- $P(x, y) = P(0, 9)$

31). $O(0, 0) \rightarrow$ origin

$A(36, 15) = A(x, y)$

$\rightarrow$ Distance from origin

$AO = \sqrt{x^2 + y^2}$

$= \sqrt{(36)^2 + (15)^2}$

$= \sqrt{1296 + 225}$

$= \sqrt{1521}$

$\boxed{AO = 39 \text{ units}}$

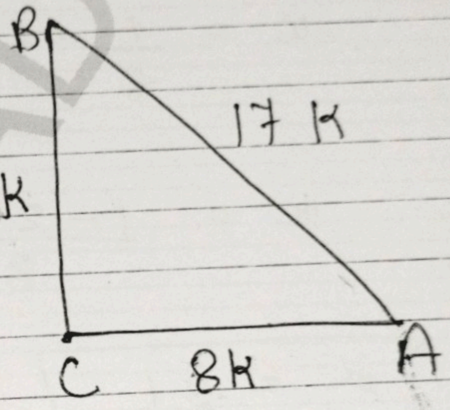
32) $15 \cot A = 8$

$$\cot A = \frac{8}{15} = \frac{AC}{BC} = K, \text{ say}$$

$AC = 8K$

$BC = 15K$

→ Applying pythagoras theorem,



$$AB^2 = BC^2 + AC^2$$

$$= (15K)^2 + (8K)^2$$

$$= 225K^2 + 64K^2$$

$$AB^2 = 289K^2$$

$$AB = \sqrt{289K^2} = 17K$$

$$\sin A = \frac{BC}{AB}$$

$$\sin A = \frac{15\cancel{K}}{17\cancel{K}} \qquad \boxed{\sin A = \frac{15}{17}}$$

$$\sec A = \frac{AB}{AC} = \frac{17\cancel{K}}{8\cancel{K}} = \boxed{\frac{17}{8}}$$

33). $x \cot^2 45 - \sec^2 60° + \sin^2 30 = \frac{1}{8}$

$x(1)^2 - (2)^2 + \left(\frac{1}{2}\right)^2 = \frac{1}{8}$

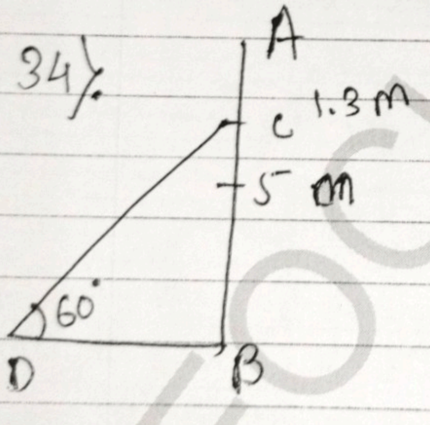
$x - 4 + \frac{1}{4} = \frac{1}{8}$

$x = \frac{1}{8} - \frac{1}{4} + \frac{4}{1}$

$x = \frac{1-2+32}{8}$

$\boxed{x = \frac{31}{8}}$

34).



AB = 5m = height of pole

AC = 1.3m

BC = 5 − 1.3

= 7.7 m

CD = l = length of ladder

ΔCBD is a right angle triangle

$\sin D = \frac{BC}{CD}$

$\sin 60^\circ = \frac{3.7}{l}$

$\frac{\sqrt{3}}{2} = \frac{3.7}{l}$

$l = \frac{3.7 \times 2}{\sqrt{3}}$

$l = \frac{7.4}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

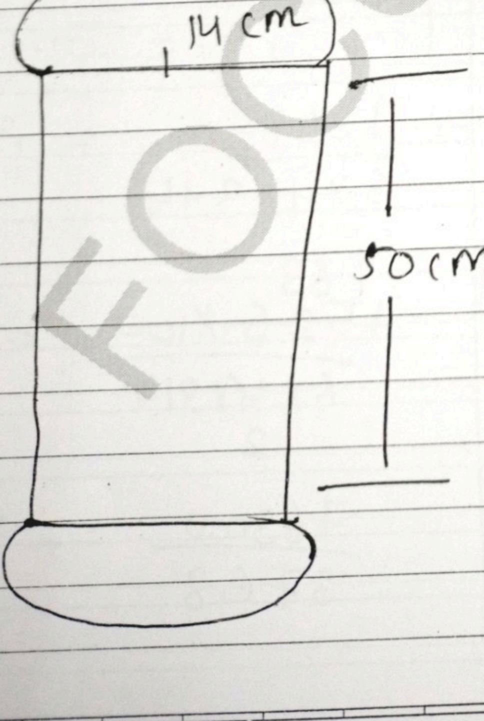
$l = \frac{7.4\sqrt{9}}{3}$

$l = 2.46 \times 1.73$

$l = 2.5 \times 1.73$

$\boxed{l = 4.32 \text{ m}}$

35



cylinder $h = 50$ cm

$r = 14$ cm

hemisphere

$r = 14$ cm

T.S.A. = C.S.A. of cylinder + 2 × C.S.A. of H.S

$2\pi r h + 2 \times 2 \pi r^2$

$= 2\pi r (h + 2r)$

$2 \times \frac{22}{\cancel{7}} \times \cancel{14}^{2} \times (50 + 2 \times 14)$

$2 \times 22 \times 2 \times (50 + 28)$

$2 \times 22 \times 2 \times 78$

88×78

$\boxed{T.S.A = 6864 \ cm^2}$

36) cost $= 1526$ ₹
Rate $= 6$ ₹$/m^2$

→ cost — S. Area
6 ₹ — $1 m^2$

∴ 1526 ₹ — !

$S.A = \frac{1526 \times 1}{6}$

$SA = \frac{1526}{6} \ m^2$

SA of sphere $= 4\pi r^2$

$\frac{1526}{6} = 4 \times 3.14 \times r^2$

$\frac{1526}{6 \times 4 \times 3.14} = r^2$

$\frac{\cancel{1526}^{763} \times 100}{6 \times \cancel{4}^{2} \times 314} = r^2$

$\frac{76300}{3768} = r^2$

$$r^2 = \frac{\overset{38150}{\cancel{76300}}}{\underset{1884}{\cancel{3768}}} = \frac{\overset{19075}{\cancel{38150}}}{\underset{942}{\cancel{1884}}}$$

$$r^2 = \frac{19075}{942} = 20.25$$

$$r = \sqrt{20.25} = \boxed{4.5\,m}$$

37)

$a = 50$

$\Sigma f_i v_i = -36$

$\Sigma f_i = 35$

$h = 10$

$\bar{x} = (?)$

mean, $\bar{x} = a + \frac{\Sigma f_i v_i}{\Sigma f_i} \times h$

$= 50 + \frac{-36}{35} \times 10$

$= 50 - \frac{72}{7}$

$= 50 - 10.285$

$= 50 - 10.29$

$$\boxed{\bar{x} = 39.71}$$

38) $x + y = 14$ .... (i)
$2x - y = 13$ ...... (ii)

Adding eq. (i) and (ii)

$$\begin{aligned} x + \cancel{y} &= 14 \\ 2x - \cancel{y} &= 13 \\ \hline 3x &= 27 \\ x &= \frac{27}{3} \\ \boxed{x = 9} \end{aligned}$$

Putting the value of x in eq (i)

Eq (i) $x + y = 14$
$9 + y = 14$
$y = 14 - 9$
$y = 6$

$\rightarrow$ $x - y = 9 - 5$
$\boxed{x - y = 4}$

39) let the two numbers be x and y $(x > y)$

$x - y = 26$ .... (i)
$x = 3y$ .... (ii)

Putting the value of x in eq.(i)

Eq(i) $x - y = 26$

$3y - y = 26$

$2y = 26$

$y = \frac{26}{2}$

$\boxed{y = 13}$

Eq(ii) $x = 3y$

$x = 3(13)$

$\boxed{x = 39}$

Two numbers are 13 and 39.

40) AP, 34, 32, 30, ..., 10.

$a = 34$

$d = 32 - 34 = -2$

$a_n = 10$

n^{th} term of A.P.

$a_n = a + (n-1)d$

$10 = 34 + (n-1)(-2)$

$10 - 34 = (n-1)(-2)$

$-24 = (n-1)(-2)$

$\frac{\cancel{+24}^{12}}{\cancel{+2}} = n - 1$

$12 = n - 1$

$12 + 1 = n$

$\boxed{13 = n}$

Sum of n terms

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$= \frac{13}{2}[2(34) + (13-1)(-2)]$$

$$= \frac{13}{2}[68 + (12)(-2)]$$

$$\frac{13}{2}[68 - 24]$$

$$\frac{13}{\cancel{2}}[\cancel{44}^{22}]$$

$$= 13 \times 22$$

$$= \boxed{S_n = 286}$$

$$\boxed{\text{sum} = 286}$$

41). $A(x_1, y_1) = A(2, -5)$
$B(x_2\ y_2) = B(-2, 9)$

let $P(X, Y)$ be the point on X-axis which is equidistance from A and B

$$P(x, y) = P(x, 0)$$
$$AP = PB$$
$$AP^2 = PB^2.$$

$$(x_1 - x)^2 + (y_1 - y)^2 = (x_2 - x)^2 + (y_2 - y)^2$$

$$(2 - x)^2 + (-5 - 0)^2 = (-2 - x)^2 + (9 - 0)^2.$$

$$4 - 4x + x^2 + 25 = 4 + 4x + x^2 + 81$$

$$29 - 4x = 85 + 4x.$$
$$29 - 85 = 4x + 4x.$$
$$29 - 85 = 4x + 4x$$
$$-56 = 8x$$
$$\frac{-56}{8} = x$$

$$-7 = x.$$

$$x = -7$$

$$P(x, y) = P(-7, 0).$$

42).

$A(-2,2)$ $P(x_2, y_2)$ $Q(x_3, y_3)$ $R(x_4, y_4)$ $B(2,8)$

$A(x_1, y_1) = A(-2,2)$
$B(x_2, y_2) = B(2,8)$

→ Q is the midpoint of AB.

$x_3 = \frac{x_1 + x_2}{2}$, $y_3 = \frac{y_1 + y_2}{2}$

$= \frac{-2+2}{2}$ $= \frac{2+8}{2}$

$= \frac{0}{2}$ $= \frac{10}{2}$

$x_3 = 0$ $y_3 = 5$.

→ $Q(0,5)$

→ P is the midpoint of AQ.

$x_2 = \frac{x_1 + x_3}{2}$, $y_2 = \frac{y_1 + y_3}{2}$

$= \frac{-2+0}{2}$ $= \frac{2+5}{2}$

$= \frac{-2}{2}$ $= \frac{7}{2}$

$x_2 = -1$ $y_2 = \frac{7}{2}$.

→ $P\left(-1, \frac{7}{2}\right)$.

→ R is the midpoint of QB.

$x_4 = \frac{x_3 + x_5}{2}$, $y_4 = \frac{y_3 + y_5}{2}$

$= \frac{0+2}{2}$ $= \frac{5+8}{2}$

$= \frac{2}{2}$ $y_4 = \frac{13}{2}$

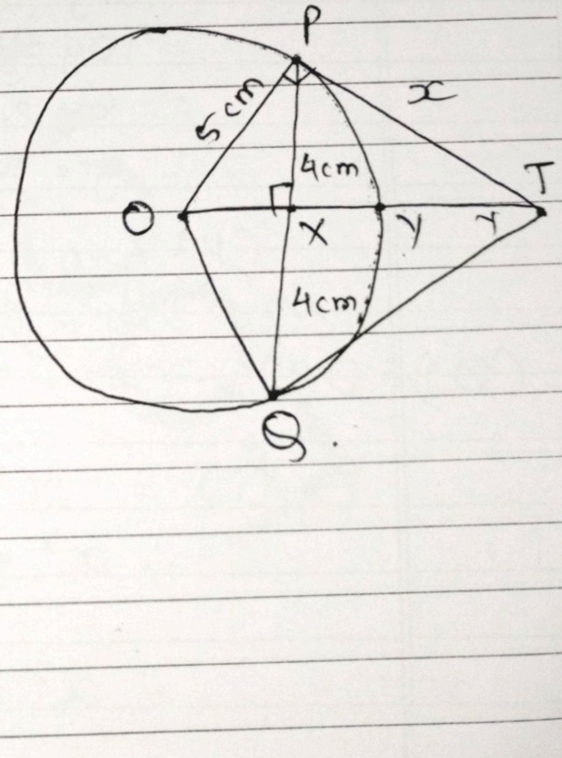
$x_4 = 1$

→ $R(1, 13/2)$.

Ans.

$P(-1, 7/2)$
$Q(0, 5)$
$R(1, 13/2)$.

43)



Here,
$OP = 5 cm$.
$OY = 5 cm$
$PQ = 8 cm$.
$Px = \frac{8}{2} = 4 cm$.

In ΔPXO, $\angle x = 90$

$PO^2 = PX^2 + OX^2$

$\therefore (5)^2 = (4)^2 + OX^2$

$\therefore 25 = 16 + OX^2$

$\therefore 25 - 16 = OX^2$

$\therefore OX^2 = 9$

$\therefore 3 = OX$

$\therefore OX = 3$ cm.

In ΔOPT, $\angle P = 90°$

$OT^2 = PO^2 + PT^2$

$\therefore (y+5)^2 = 5^2 + x^2$

$\therefore y^2 + 10y + 25 = 25 + x^2$

$\therefore 10y = x^2 - y^2$.

$\therefore x^2 - y^2 = 10y$ ...... (i)

$\longrightarrow$ In ΔPXT, $\angle X = 90°$

$PT^2 = PX^2 + XT^2$

$\therefore x^2 = 4^2 + (y+2)^2$

$\therefore x^2 = 16 + y^2 + 4y + 4$.

$\therefore x^2 - y^2 = 4y + 20$ ...... (ii)

$\longrightarrow$ Equating eq (i) & (ii)

$10y = 4y + 20$

$\therefore 10y - 4y = 20$.

$\therefore 6y = 20$

$\therefore y = \frac{20}{6}$

$\therefore y = \frac{10}{3}$

Eq (i) = $x^2 - y^2 = 10y$.

$\therefore x^2 - \left(\frac{10}{3}\right)^2 = 10\left(\frac{10}{3}\right)$

$\therefore x^2 - \frac{100}{9} = \frac{100}{3}$

$\therefore x^2 = \frac{100}{3} + \frac{100}{9}$

$\therefore x^2 = \frac{300+100}{9}$

$\therefore x^2 = \frac{400}{9}$

$\therefore x = \sqrt{\frac{400}{9}}$

$\therefore x = \frac{20}{3}$ cm.

44)

→ let a quadrilateral be ABCD which circumscribe a circle.

By theorem 10.2, the lengths of the tangents drawn from an external point to a circle are equal.

Hence,

$AP = AS$ .... (1)

$BP = BQ$ .... (2)

$CR = CQ$ .... (3)

$DR = DS$ .... (4)

Adding equations (1), (2), (3) and (4)

$AP + BP + CR + DR = AS + BQ + CQ + DS$.

$\therefore (AP + BP) + (CR + DR) = (AS + DS) + (BQ + CQ)$

$\therefore \underline{AB} + \underline{CD} = \underline{AD} + \underline{BC}$

45> No. of cars frequency.

No. of cars	frequency	
0 - 10	7	
10 - 20	14	
20 - 30	13	
30 - 40	12	← f_0
40 - 50	20	← f_1
50 - 60	11	← f_2
60 - 70	15	
70 - 80	8	

Highest fre. ∴
Modal class is 40

$l = 40$
$f_0 = 12$
$f_1 = 20$
$f_2 = 11$
$h = 10$

Mode

$$Z = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$$

$$= 40 + \left(\frac{20 - 12}{2 \times 20 - 12 - 11}\right) \times 10$$

$$= 40 + \left(\frac{8}{40 - 23}\right) \times 10$$

$$= 40 + \frac{8}{17}$$

$$= 40 + 4.71$$

$$\underline{\underline{Z = 44.71}}$$

46>

Date / /

46) $\rightarrow P(A) : P(\bar{A}) = 5 : 3$

$$\therefore \frac{P(A)}{P(\bar{A})} = \frac{5}{3}$$

$\rightarrow P(A) + P(\bar{A}) = 1$.

$$\therefore \frac{1 - P(\bar{A})}{P(\bar{A})} = \frac{5}{3}$$

$$\therefore \frac{1}{P(\bar{A})} - \frac{\cancel{P(\bar{A})}}{\cancel{P(\bar{A})}} = \frac{5}{3}$$

$$\therefore \frac{1}{P(\bar{A})} - 1 = \frac{5}{3}$$

$$\therefore \frac{1}{P(\bar{A})} = \frac{5}{3} + 1$$

$$\therefore \frac{1}{P(\bar{A})} = \frac{5+3}{3}$$

$$\therefore \frac{1}{P(\bar{A})} = \frac{8}{3}$$

$$\boxed{\therefore P(\bar{A}) = \frac{3}{8}}$$

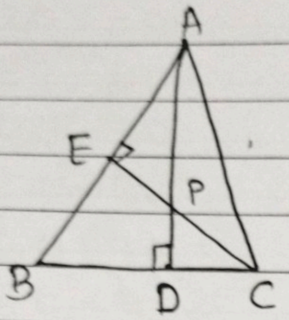
$$\rightarrow P(A) = 1 - P(\bar{A})$$
$$= 1 - \frac{3}{8}$$
$$= \frac{8-3}{8}$$

$$\therefore P(A) = \frac{5}{8}.$$

SECTION - D.

48)

47)



Given : In ΔABC , $AD \perp BC$
$EC \perp AB$

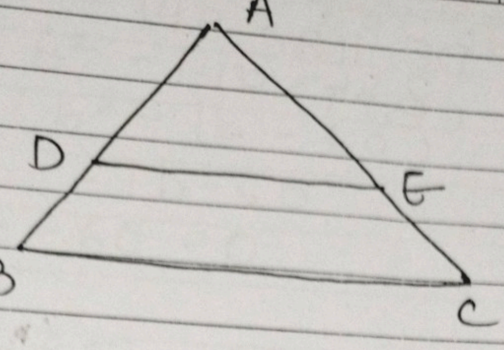
To prove : (1) $\Delta AEP \sim \Delta CDP$
(2) $\Delta ABD \sim \Delta CBE$

Sol^n :- (1) In ΔAEP & ΔCDP
$\angle E = \angle D$ (Both are 90°)
$\angle P = \angle P$ (Vertically opposite angles)
Acc. to AA critesm.
$\Delta AEP \sim \Delta CDP$

(2) In ΔABD & ΔCBE.
$\angle D = \angle E$ (Both are 90°)
$\angle B = \angle B$ (common angles)
Acc to AA criterion.
$\Delta ABD \sim \Delta CBE$

Hence proved

48)



(1) In $\triangle ABC$.

Given : $DE \parallel BC$

$AD = 1.5$ cm
$BD = 3$ cm
$AE = 1$ cm
$EC = (?)$

→ In $\triangle ABC$, $DE \parallel BC$

$$\frac{AD}{DB} = \frac{AE}{EC}$$

$$\therefore \frac{1.5}{3} = \frac{1}{EC}$$

$$\therefore \frac{1}{2} = \frac{1}{EC}$$

$\therefore 2 = EC$

$\therefore EC = 2$ cm

(2) In $\triangle ABC$

Given : $DE \parallel BC$.

→ $AE = 1.8$ cm
$EC = 5.4$ cm
$DB = 7.2$ cm $\quad AD = (?)$

→ In ΔABC, $DE \parallel BC$

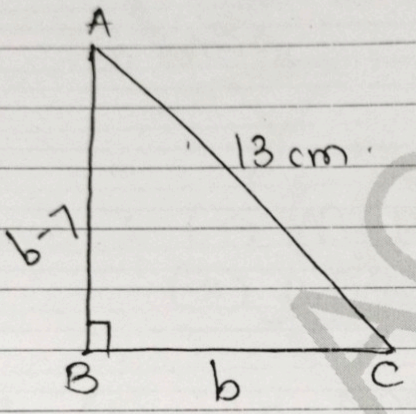
$$\frac{AD}{DB} = \frac{AE}{EC} \quad (BPT)$$

$$\therefore \frac{AD}{7.2} = \frac{1.8}{5.4}$$

$$\therefore AD = \frac{7.2}{3}$$

$$\therefore AD = 2.4 \text{ cm}$$

49)



→ let the base of right angle triangle be b

Altitude = $b-7$

$AC = 13$ cm.

→ ΔABC is right angle triangle, $\angle B = 90^\circ$

Acc to pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$

$$\therefore 13^2 = (b-7)^2 + b^2$$

$$\therefore 169 = b^2 - 14b + 49 + b^2$$

$$\therefore 169 = 2b^2 - 14b + 49$$

$\therefore 0 = 2b^2 - 14b + 49 - 169$

$\therefore 0 = 2b^2 - 14b - 120$

$\therefore 0 = 2(b^2 - 7b - 60)$

$\therefore 0 = b^2 - 7b - 60$

$\therefore b^2 - 7b - 60 = 0$

-60

-12 5

$\therefore b^2 - 12b + 5b - 60 = 0$

$\therefore b(b-12) + 5(b-12) = 0$

$\therefore (b-12)(b+5) = 0$

$\therefore b - 12 = 0 \quad , \quad b + 5 = 0$

$\therefore \underline{b = 12} \quad , \quad b = -5 \ (\times)$

$\rightarrow$ Altitude $= b - 7$

$= 12 - 7$

$= 5$ cm

Ans :- The measure of two sides are 12 cm and 5 cm.

50) $\rightarrow$ Saving in 1^{st} Week = 5 ₹

Saving in 2^{nd} week $= 5 + 1.75 = 6.75$ ₹

Saving in 3^{rd} week $= 6.75 + 1.75 = 8.50$ ₹

Saving in n^{th} week $= 20.75$ ₹

The condition of yashraj's saving forms an A

AP = 5, 6.75, 8.5, ..., 20.75

$a = 5$
$d = 1.75$
$a_n = 20.75$
$n = (?)$

n^{th} term of an AP.

$a_n = a + (n-1)d$
$\therefore 20.75 = 5 + (n-1)1.75$
$\therefore 20.75 - 5 = (n-1)1.75$
$\therefore 15.75 = (n-1)1.75$
$\therefore \frac{15.75}{1.75} = n-1$
$\therefore 9 = n-1$
$\therefore n = 1+9$
$\therefore n = 10$

51)

Class	frequency	x_i	(x_i-a) d_i	$(d_i/2)$ u_i	f_iu_i
0.00-0.04	4	0.02	-0.08	-2	-8
0.04-0.08	9	0.06	-0.04	-1	-9
0.08-0.12	9	0.10	0	0	0
0.12-0.16	2	0.14	0.04	1	2
0.16-0.20	4	0.18	0.08	2	8
0.20-0.24	2	0.22	0.12	3	6
	$\Sigma f_i = 30$				$\Sigma f_iu_i = -1$

→ Mean,

$\bar{x} = a + \left(\frac{\Sigma f_iu_i}{\Sigma f_i}\right) \times h$

$= 0.1 + \frac{-1}{30} \times 0.04$ $\left(\begin{array}{l} h = 0.04 - 0 \\ = 0.04 \end{array} \right)$

$= 0.1 - \frac{4}{3 \times 1000}$

$= 0.1 - \frac{1.33}{1000}$

$= 0.1 - 0.001$

$= 0.099$

$\left\{ \begin{array}{r} 0.100 \\ 0.001 \\ \hline 0.099 \end{array} \right\}$

~~$\therefore \bar{x} = 0.00$~~

$\therefore \bar{x} = 0.99$ ppm

52}

Class interval	Frequency (fi)	cf
0 - 10	5	5
10 - 20	x	$x+5$
20 - 30	20	$x+25$
30 - 40	15	$x+40$
40 - 50	y	$x+y+40$
50 - 60	5	$x+y+45$
	$\Sigma fi = x+y+45$	

$\rightarrow x+y+45 = 60$

$\therefore x+y = 60-45$

$\therefore x+y = 15 \quad \ldots\ldots \quad (i)$

Median = 28.5

Median class $\rightarrow$ 20-30

$l = 20$

$f = 20$

$cf = x + 5$

$\frac{n}{2} = \frac{60}{2} = 30$

$h = 10$

$\longrightarrow$ median, $m = l + \left(\frac{n/2 - cf}{f}\right) \times h$

$\therefore 28.5 = 20 + \left(\frac{30 - x - 5}{20}\right) \times 10$

$\therefore 28.5 - 20 = \frac{25 - x}{2}$

$\therefore 8.5 = \frac{25 - x}{2}$

$\therefore 8.5 \times 2 = 25 - x$

$\therefore 17 = 25 - x$

$\therefore x = 25 - 17$

$\therefore \underline{\underline{x = 8}}$

Eq (i)

$x + y = 15$

$\therefore 8 + y = 15$

$y = 15 - 8$

$\therefore \underline{\underline{y = 7}}$

53)

a - Total no. of balls = 3

No. of red balls = 1
No. of blue ball = 1
No. of yellow ball - 1.

(1) $p(\text{yellow ball}) = \dfrac{\text{No. of Yellow ball}}{\text{Total No. of balls}}$

$$\boxed{= \frac{1}{3}}$$

(2) $p(\text{not a red ball}) = \dfrac{\text{No. of balls which are not red}}{\text{Total no. of balls}}$

$$= \frac{1+1}{3}$$

$$\boxed{= \frac{2}{3}}$$

b - Total no. of students = 330 + 220
= 550

→ No. of boys = 330
→ No. of girls = 220
→ No. of students of class IX = 220+110 = 330
→ No. of Students of class X = 210+110 = 220

Date / /

(1) p(a boy is elected) = $\frac{\text{Total no. of boys}}{\text{Total no. of students}}$

$= \frac{330}{550}$

$\boxed{= \frac{3}{5}}$

(2) p(Students elected from class X) = $\frac{\text{No. of Students of class X}}{\text{Total no. of students}}$

$= \frac{220}{550}$

$\boxed{= \frac{2}{5}}$

54) → Total no. of Cards = 52

(1) p(getting seven) = $\frac{\text{No. of Seven no. cards}}{\text{Total no. of cards.}}$

$= \frac{4}{52}$

$\boxed{= \frac{1}{13}}$

(2) p(getting spade) = $\frac{\text{No. of Spade in cards}}{\text{Total no. of cards}}$

$= \frac{13}{52}$

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

(3) P(black cards) = $\frac{\text{No. of black cards}}{\text{Total no. of cards}}$

$= \frac{13+13}{52}$

$= \frac{26}{52}$

$\boxed{= \frac{1}{2}}$.

(14) P(not a king) = $\frac{\text{No. of cards excluding king}}{\text{Total no. of cards}}$

$= \frac{52-4}{52}$

$= \frac{48}{52}$

$\boxed{= \frac{12}{13}}$.