SEE 2080 (2024)

(Group A')

Q.No: 1

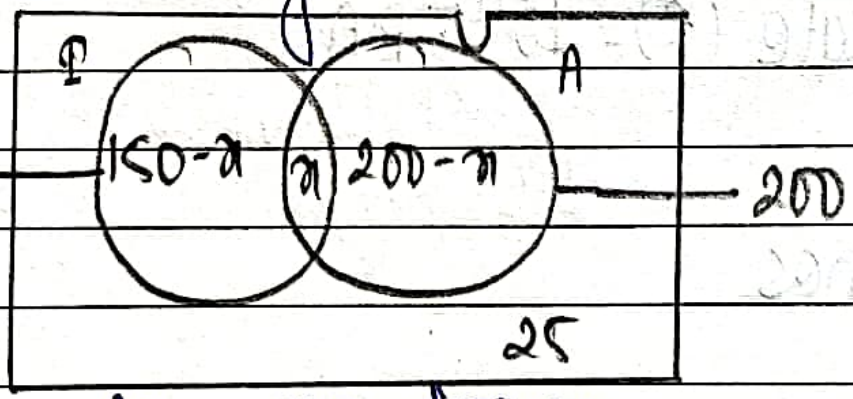
Sol: Let 'U' be the total no of student and 'I' and 'A' denotes no of people who like I-phone and Andriod phone respectively,

Now,

$n(U) = 300$, $n(I) = 150$, $n(A) = 200$, $n(\overline{I \cup A}) = 25$ & $n(I \cap A) = ?$

(a) $n(\overline{I \cup A})$ represents the people who didn't like Iphone & Andriod phone both.

(b) In venn diagram,



from venn diagram,

(c) $n(U) = n(I) + n(A) + n(I \cap A) + n(\overline{I \cup A})$

Or, $300 = 150 - x + 200 - x + x + 25$

Or, $300 - 375 = -x$

Or, $+75 = +x$

$\therefore x = 75$ #

Now,

∴ No of people who like T-phone only,

$$n(T) = n(T) - n(T \cap A)$$
$$= 150 - 75$$
$$= 75\#$$

(d) Acc to qn.

$n(T \cap A) / n(T \cap \overline{A}) = 75/25 = 3$

∴ By three times people like both phone than who don't like both phone.

Q NO: 2

soln

Principal (P) = Rs. 80,000

time (T) = 2 yrs

Rate (R) = 10% P.A

(a)

4 times

(b)

Semi Anually C.I $= P\left[\left(1 + R/200\right)^{2T} - 1\right]$

$$= P\left[\left(1 + \frac{10}{200}\right)^{2\times 2} - 1\right]$$

$= RS. 80,000 \times 0.21550625$

$= RS. 17240.5$ #

(c) C.A = 1,06480

↳ We know that,

Or, $C.A = P(1 + R/100)^T$

Or, $\frac{1,06,480}{80000} = \left(1 + \frac{10}{100}\right)^T$

Or, $1.331 = (1.1)^T$

Or, $(1.1)^3 = (1.1)^T$

$\therefore T = 3$ yrs.

Hence, After 3 yrs.

QNO: 3

Soln: Initial price (V_0) = RS 40,00,000

Depreciates Rate (R) = 15% P.A

Time (t) = 3 yrs

(a) $V_T = V_0\left(1 - R/100\right)^T$

(b)

↳ $V_T = V_0\left(1 - R/100\right)^T$

$= V_0\left(1 - 15/100\right)^3 = RS\ 40,00,000 \times \frac{4913}{8000}$

= Rs 2456500 #

∴ Hence Selling price of bus is rs 2456500

(c)

↳ Profit made or earned by bus (X) = Rs 15,00,000

S.P of bus (Y) = Rs 2456500

∴ Total gain made bus (P) = X + Y

= Rs 15,00,000 + Rs 2456500

= Rs 3956500 #

Now,

Loss. since Gain < Initial price

Hence Loss % = $\frac{-T + V_0}{T_{V_0}} \times 100\%$ [∵ CP = V_0]

= $\frac{40,00,000 - 39,56,500}{40,00,000} \times 100\%$

= 1.08 % #

Q No: 4 Sol^n

Buying rate, 1$ = Rs 132

Selling rate, 1$ = Rs 133

(a)

↳ Using selling rate. since bank will sell us $133

1 $ = Rs 133

Rs 332500 = $ $\frac{332500}{133}$

= $ 2500 #

(b) Using buying rate since, bank will buy $ with NPS (find.)

1 $ = Rs 132

$ 2800 = Rs 2800 × 132

= Rs 3,69,600

Hence, He will get Rs 3,69,600 #

(c)

4 Since After 10 days,

1 $ = Rs 138·32

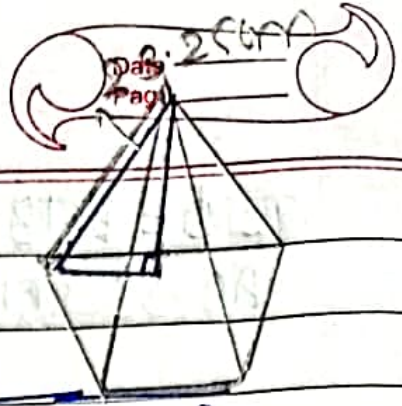
Now,

∴ % of Nepalese rupee or currency devaluated by,

$= \frac{138·32 - 133}{133} \times 100$

= 4·1.

Hence by 4·1., it is devaluated.



Q.NO: 5

Sol: Height (h) = 21 cm

length of base (a) = 20 cm

also, Slant height (l) = $\sqrt{h^2 + \left(\frac{a}{2}\right)^2}$

$= \sqrt{(21)^2 + \left(\frac{20}{2}\right)^2}$

$= \sqrt{(23.25)^2}$

$= 23.25$ #

4(a) There are four triangular surface.

(b) Slant height (l) of the pyramid is $\sqrt{541}$ cm i.e 23.25 cm

(c) T.S.A of pyramid (T) = C.S.A + Area of base

$= 2a \cdot l + a^2$

$= 2 \times 20 \times 23.25 + (20)^2$

$= 1330\ cm^2$ #

Now,

Rate (R) = Rs 5/cm^2

$T = 1330 cm^2$

Total cost (T'') = $T \times R$

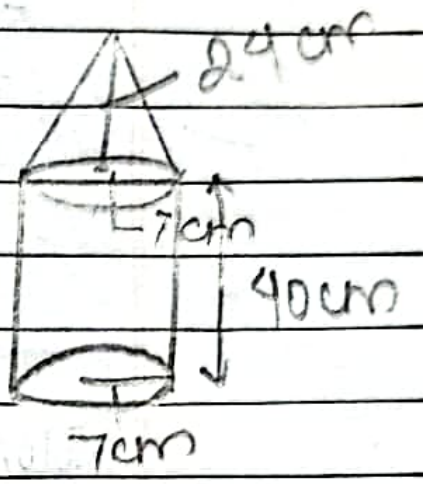
$= 1330 \times$ Rs 5

$=$ Rs 6650 #

∴ Rs 6650 is required to colour total surface area of pyramid.

Q NO: 6

Soln. Common Radius (r) = 7cm
Height of cylinder (h') = 40cm
for cone,



radius (r) = 7cm
height (h) = 24cm
also, slant height (l) = $\sqrt{h^2 + r^2}$
$= \sqrt{(24)^2 + (7)^2}$
$= \sqrt{625}$
$= 25$cm

(a) C.S.A = $\pi r l$

(b) volume of object (V) = volume of cone + volume of cylinder.
$= \frac{1}{3}\pi r^2 h + \pi r^2 h$
$= \frac{1}{3} \times \frac{22}{7} \times (7)^2 \times 24 + \frac{22}{7} \times (7)^2 \times 40$
$= 1,232 + 6160$
$= 7,392 \text{ cm}^2$ #

(c) T.S.A of object (T) = C.S.A of (cone + cylinder) + area of base

$= \pi rl + 2\pi rh_1 + \pi r^2$

$= \frac{22}{7} \times 7 \times 25 + 2 \times \frac{22}{7} \times 7 \times 40 + \frac{22}{7} \times (7)^2$

$= 550 + 1760 + 154$

$= 2464 \text{ cm}^2$ #

Now, volume of cone (V_1) $= 1/3 \pi r^2 h$

$= 1/3 \times \frac{22}{7} \times (7)^2 \times 24$

$= 1232 \text{ cm}^3$ #

$V = V_1 +$ volume of cylinder (V_c)

Or, $7392 = 1232 + V_c$

Or, $7392 - 1232 = V_c$

$\therefore V_c = 6160 \text{ cm}^3$

then,

$V_c > V_1$

Difference (D) $= V_c - V_1$

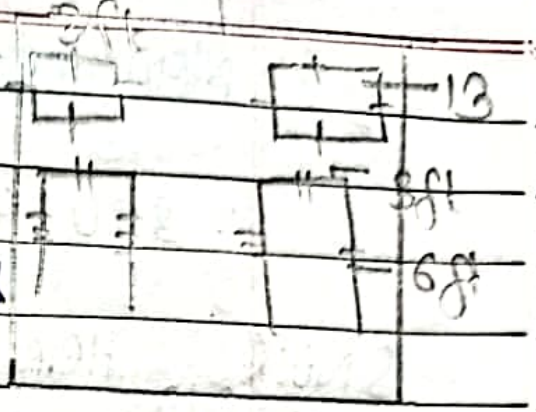
$= 6160 - 1232 \text{ cm}^3$

$= 4928 \text{ cm}^3$

$\therefore$ volume of cylinder is 4928 cm^3 bigger than volume of cone.

Date
Page

Q.NO: 7 Sol: length (l) = 14ft
breadth (b) = 13ft
height (h) = 10ft
also, 2 window = 3 feet edges
2 doors = 6ft × 3ft.



↳ Area of 4 wall & ceiling including 2 window & 2 door $= 2h(l+b) + (l \times b) - \{(2l)^2 - 2(6 \times 3)$
$= 2 \times 10 (14+13) + (14+13) - 2 \times 3^2 - 2 \times 18$
$= 668 ft^2$

Now,
Rate (R) = Rs 36 / ft^2
total cost (T) = $T \times A$
= Rs 36 × 668
= Rs 24048 #

1 m = 3.28ft

(b)

↳ Old : Rate of painting per square feet = Rs 36
Old : Rate of painting per square meter = $(3.28)^2 \times 36$
= Rs 387.30

According to question,

New rate / m^2 = ~~378~~ 378.30 + 1/3 + 387.30

= Rs 516.40 #

New rate per ft^2 = Rs $\frac{516.40}{(3.28)^2}$ = Rs 48 #

New cost = Rs 48 × 668
= 32064
∴ 32064 − 24048 = 8016 will increases #

Q NO: 8 Soln: Here, a = 1, b = 243 & n = 3

(a) 4 $r = \left(\frac{b}{a}\right)^{\frac{1}{n+1}}$

$= \left(\frac{243}{1}\right)^{\frac{1}{3+1}}$

$= 3.94$

(b) 4 $g_3 = ar^3$

$= 1 \times 3.94^3$

$= 61.54$ #

(c) 4 $AM = \frac{a+b}{2} = \frac{1+243}{2}$

$= 122$ #

$GM = \sqrt{ab} = \sqrt{243}$

$= 15.58$

$d = 122 - 15.58$

$= 106.41$

∴ AM is 106.41 more than GM

QNO: 9 SOLN

(a) $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

(b)

$2(l+b) = 66$

$2l + 2b = 66$

$2l = 66 - 2b$

$l = \frac{66-2b}{2}$ — (I)

$A = 260$

$l \times b = 260$

$l = \frac{260}{b}$ — (II)

from (I) & (II)

$\frac{66-2b}{2} = \frac{260}{b}$

$66b - 2b^2 = 520$

$0 = 520 - 66b + 2b^2$

$0 = 2(260 - 33b + b^2)$

$b^2 - 33b + 260 = 0$

$b^2 - (20+13)b + 260 = 0$

$b^2 - 20b - 13b + 260 = 0$

$b(b-20) - 13(b-20) = 0$

$(b-20)(b-13) = 0$

Either, $b = 20$ OR $b = 13$

Putting $b = 20$ on (II)

$l = \frac{260}{20} = 13$ #

Putting $b = 13$ on (II)

$l = \frac{260}{13}$

$= 20$ #

10a) Simplify

Soln $\frac{x+y}{x-y} - \frac{x-y}{x+y}$

$= \frac{(x+y)^2 - (x-y)^2}{x^2-y^2}$

$= \frac{x^2+2xy+y^2 - x^2+2xy-y^2}{x^2-y^2}$

$= \frac{4xy}{x^2-y^2}$ //.

b) $4^x + \frac{1}{4^x} = 16\frac{1}{16}$

Solution:

let us consider 4^x be b

or, $b + \frac{1}{b} = \frac{257}{16}$

or, $\frac{b^2+1}{b} = \frac{257}{16}$

or, $16b^2 + 16 = 257b$

or, $16b^2 - 257b + 16 = 0$

or, $(b-16)\left(b-\frac{1}{16}\right) = 0$

Either, $b-16=0$ or, $b - 1/16 = 0$

or, $b = 16$ or, $b = 1/16$

or, $4^x = 16$ or, $4^x = 1/16$

or, $4^x = 4^2$ or, $4^x = 4^{-2}$

$\therefore x = 2$ $\therefore x = -2$

$\therefore x = 2$ or -2

11 a) Solution:

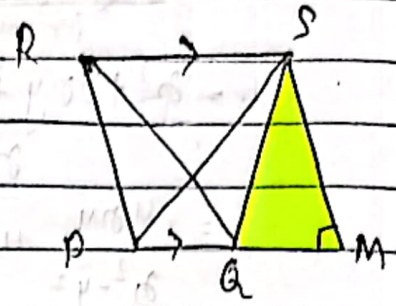
The relation between the areas of given two triangles are equal because they are on same base and lies between same parallel lines.

b) Solution:

RS // PQ

Constructing SM ⊥ PQ

SM is the height of Δ PQR & PQS



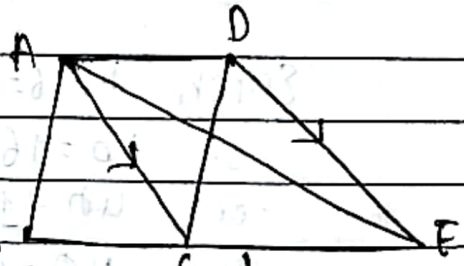
	Statement	Reason:
1)	$\Delta PQR = \frac{1}{2} PQ \times SM$	Area of $\Delta = \frac{1}{2} b \times h$
2)	$\Delta PQR = \frac{1}{2} PQ \times SM$	Same as above
3)	$\Delta PQR = \Delta PQS$	from st. (i) & (ii)

c) Solution:

Given, AC // DE

To prove: A of ABCD & A of ΔABE are equal

i.e. $\square ABCD = \Delta ABE$



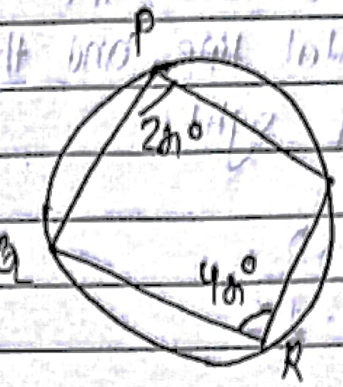
	Statement	Reason
1)	$\frac{1}{2}$ ACED = ΔACE	Diagonal AE
2)	$\frac{1}{2}$ ABCD = ΔABC	Diagonal AC
3)	ΔABC + ΔACE $= \frac{1}{2}$ ACED + $\frac{1}{2}$ ABCD	Adding (i) & (ii).

$\Delta ABE = \frac{1}{2}$ ABCD + $\frac{1}{2}$ ABCD	
ΔABE = qua. ABCD .	proved

12 a) Solution:

Here, $\angle P = 2\theta^\circ$

$\angle R = 4\theta^\circ$



The relation between $\angle P$ & $\angle R$ is $\angle P + \angle R = 180^\circ$

b) $\angle P + \angle R = 180^\circ$ [being opp. side of cyclic quad]

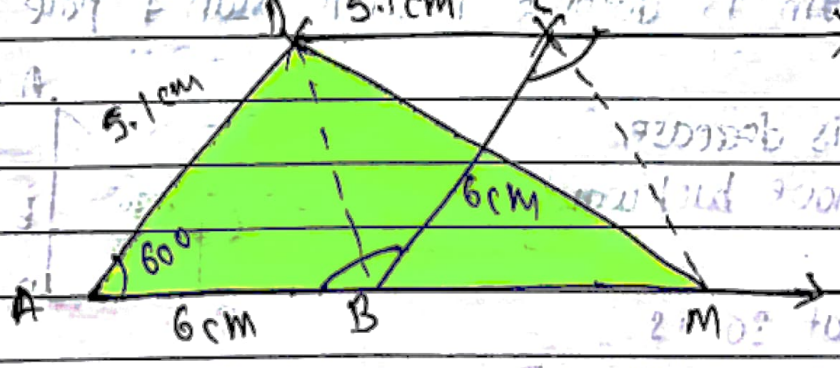
$2\theta + 4\theta = 180^\circ$

$\theta = 30^\circ$ Ans:

13) Solution:

AB = BC = 6 cm, AD = CD = 5.1 cm & $\angle DAB = 60^\circ$.

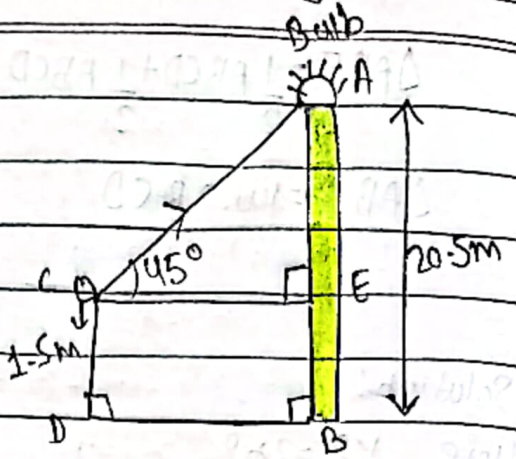
I am drawing a rough figure here:



Date
Page

11 14 a). Solution:

Angle of elevation:
The angle of elevation is an angle that is formed between the horizontal line and the line of sight.



b) AB - CD
$= 20.5 - 1.5$
$= 19$

19 is the height of man less than the height of the pole with bulb.

c) Solution:

$\angle$ of elevation ($\angle ECA$) $= 45°$

DB = ? which is distance between man & pole.

We know, DB = CE

In ΔACE,

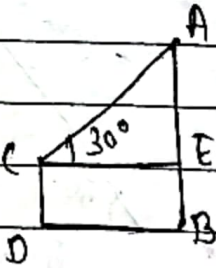
$\tan 45° = \frac{P}{b} = \frac{AE}{CE}$

$\tan 45° = \frac{19}{CE}$

$CE = 19 = DB$

$\therefore$ 19m is distance between man & pole

d) Hence, $\angle$ is decrease,
So, he move backward.
Now,
distance at 30 is



$\tan 30° = \frac{19}{CE}$ $\quad \therefore CE = 19\sqrt{3}$ m.

Q.NO.15 [2+1+2+3]

Marks	No of student	C.f
0-10	2	2
10-20	3	5
20-30	6	11
30-40	5	16
40-50	4	20

(a) Or, N/4 = 5 #

↳ 'f' denotes for class interval.

(b) Q_1 class is 10-20 so,

↳ $l = 10$, $f = 3$, $c.f = 2$, $i = 10$

$$Q_1 = l + \frac{\frac{N}{4} - c.f}{f} \times i$$

$$= 10 + \frac{5 - 2}{3} \times 10$$

$$= 8.33 \text{ Ans}$$

(c) Since highest frequency is 6. So class is 20-30

$f_1 = 6$, $f_0 = 3$, $f_2 = 5$, $i = 10$, $l = 20$

$$\text{Mode (M)} = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times i$$

$$= 20 + \left(\frac{6 - 3}{2 \times 6 - 3 - 5}\right) \times 10$$

$$= 20 + \left(\frac{3}{4}\right) \times 10$$

$$= 27.5 \#$$

(d) No of student who score more than 20 (N) = 5 + 6 + 4 = 15

Total no of student (T) = 20

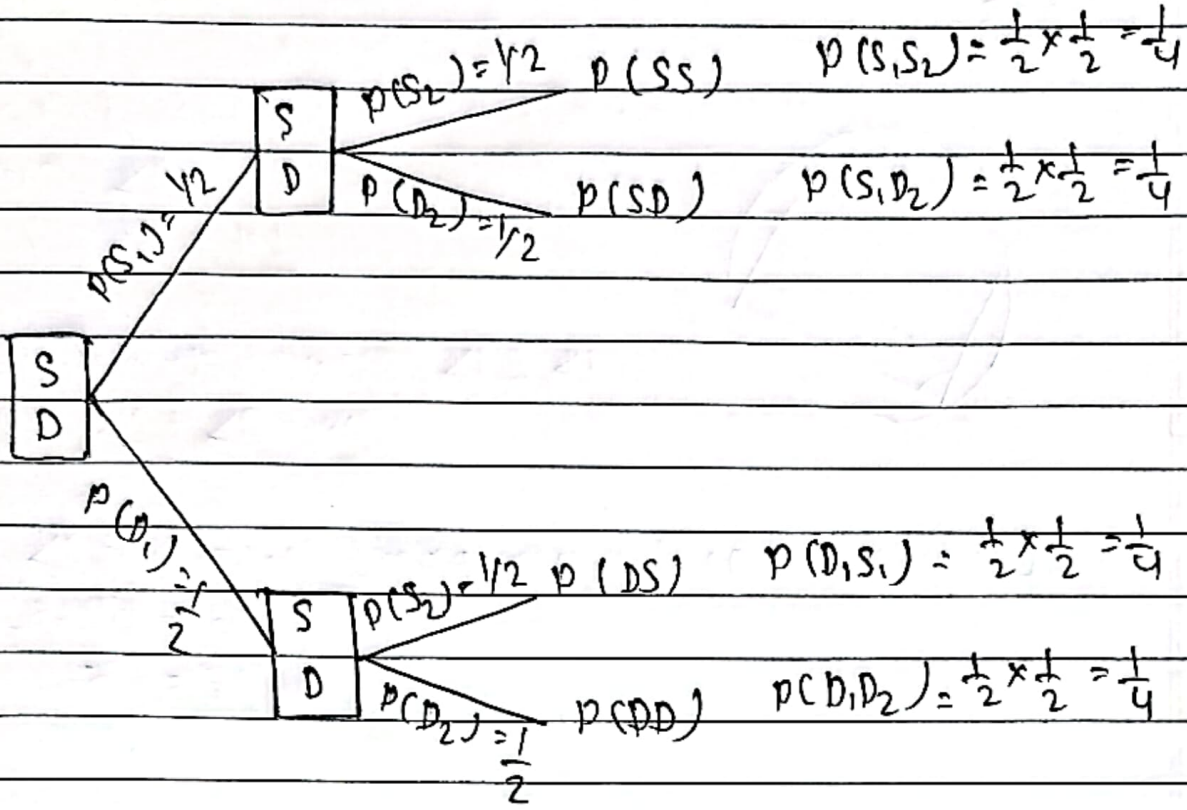
Or, $\% = \frac{N}{T} \times 100\%$

$$\% = \frac{15}{20} \times 100\%$$

$$= 75\%$$

16. a) $N(E)$
$N(U)$

i)



b) Probability of having both are daughter is,

$$P(D_1D_2) = P(D_1) \times P(D_2)$$
$$= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

d) Probability of having at least one girl

$$P(S_1D_2) + P(D_1S_2) + P(D_1D_2)$$
$$= \frac{1}{2} \times \frac{1}{2} + \frac{1}{4} + \frac{1}{4}$$
$$= \frac{3}{4} \text{ Ans.}$$