Date:
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Subject: Maths

SEE 2081 (2025)

Madhesh province [RE-1031 MP]

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Answer Sheet

Q.N. 1 Ans →

Sol^n.

Here,

Let, A be people who like apples and O be the people who like orange.

$n(U) = 160$

$n_o(A) = 75$

$n_o(O) = 45$

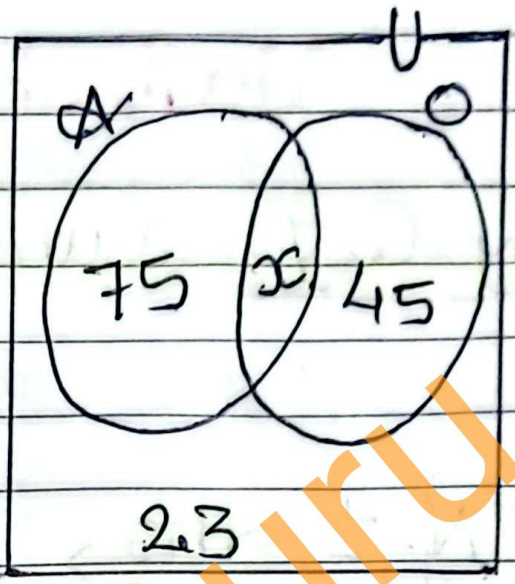
$n(\overline{A \cup O}) = 23$

$n(A \cap O) = ?$ (x Let)

(a) The cardinality notation of the no. of people who don't like any of these fruits is

$n(\overline{A \cup O}) = 23$ Ans

(b) Showing it in a Venn diagram,



(c) From Venn diagram,

$x + 75 + 45 + 23 = 160$

or, $x + 143 = 160$

or, $x = 160 - 143$

$\therefore x = 17$

So, $n(A \cap B) = 17$

Now,

The no. of people who like apple $= n(A)$

$= 75 + x$

$= 75 + 17$

$= 92$

Thus,

92 people are like an apple

(d) The no. of people who like orange = n(O)

$= 45 + x$

$= 45 + 17$

$= 62$

So, The no. of people who like apple is more than no. of people who like orange by

$= 92 - 62$

$= 30$ Ans

Q.N. 2. Ans →

Sol^n,

(a) The relation among p, R, T and C.I are as:-

$$C.I = p\left[\left(1 + \frac{R}{100}\right)^T - 1\right]$$

(b) Here,

principal (p) = RS. 4,00,000

Time (T) = 1 year
Rate % (R) = 10 % p.a.
Compound interest (CI) = ?

We have,

$$C.I = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$$

$$= 400000\left[\left(1+\frac{10}{100}\right) - 1\right]$$

$$= 400000\,[1.1 - 1]$$

$$= 400000 \times 0.1$$

$$= Rs.40000$$

Thus, The compound interest of the first year is Rs.40,000.

(c) For second year,

$P = Rs.\ 4,40,000 - Rs.\ 2,40,000$

$= Rs.\ 2,00,000$

$T = 1$ year

$R = 10\%$ p.a.

Now,

$$C.I = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$$

$$= 200000\left[\left(1+\frac{10}{100}\right)^1 - 1\right]$$

$$= 200000 \times (1.1 - 1)$$

$$= 200000 \times 0.1$$

$$= Rs.\ 20000$$

Thus, total interest paid by Niraj in 2 years is

$= Rs.\ 40000 + Rs.\ 20000$

$= Rs.\ 60,00,000$

Q.N. 3 Ans

Solⁿ.

(a) Here,
Initial price (V_0) = Rs. 40,000
Rate of depreciation = 5 % p.a.
Time (T) = 1 year
price after 1 year (V_1) = ?
We know,

$$V_T = V_0 \left(1 - \frac{R}{100}\right)^T$$

$$V_1 = 40000 \left(1 - \frac{5}{100}\right)^1$$

$$= 40000 \times 0.95$$

$$= \text{Rs. } 38000$$

Thus, the price of Machine depreciate by Rs. 2000 in first year.

Here,

(b) $V_0 = Rs.40,000$

$R = 5\%$

$T = ?$

$V_T = Rs.36,100$

We know that,

$$V_T = V_0\left(1 - \frac{R}{100}\right)^T$$

or, $36100 = 40000\left(1 - \frac{5}{100}\right)^T$

or, $\frac{36100}{40000} = (0.95)^T$

or, $(0.95)^T = 0.9025$

or, $(0.95)^T = (0.95)^2$

$\therefore T = 2$ years

Thus,

Neelam was sold the machine after 2 years.

(c) Here,
Cost price of machine (CP)
= Rs. 40000
Selling price of machine (SP)
= Rs. 36100 + Rs. 4900
= Rs. 41000
So, CP < SP

We know that,
$$\text{profit \%} = \frac{SP - CP}{CP} \times 100\%$$
$$= \frac{41000 - 40000}{40000} \times 100$$
$$= \frac{1000}{40000} \times 100$$
$$= 2.5\%$$

Thus,
She earns 2.5% profit from the machine.

Q.N.4 Ans

Sol^{n}.

(a) Selling rate is used when Ramesh exchange American dollar with Nepali rupees.

(b) Here,
Buying rate, $1 = Rs. 138.23
Selling rate, $1 = Rs. 138.83

Total NRs. = 2,07,345
Using selling rate,

$1 = NRs. 138.83

or, $NRS.1 = \$\frac{1}{138.83}$

or, $NRS.207345 = \$\frac{1}{138.83} \times 207345$

$\therefore$ NRS. 207345 = $ 1493.52

Thus,
$ 1493.52 is obtained from NRS. 2,07,345.

(c) Here,

$$\text{Devaluation \%} = \frac{140.2183 - 138.83}{138.83} \times 100\%$$

$$= \frac{1.3883}{138.83} \times 100\%$$

$$= 1\%$$

Thus,

In the given transitation, Nepali currency is devaluated by 1%.

Q.N. 5 Ans →

Sol^n

(a) There are 5 plane surface area are counted to find the total surface area of a square pyramid.

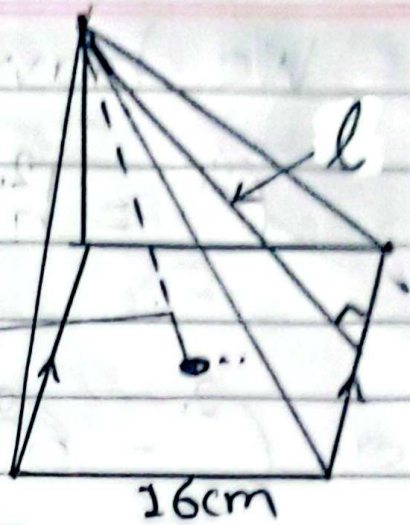
(b) Here,

Volume of square pyramid (V) $= 512\,cm^3$

Length of side (a) = 16cm

Vertical height (h) = ?
We know that,

$V = \frac{1}{3}a^2h$



or, $512 = \frac{1}{3} \times 16 \times 16 \times h$

or, $512 \times 3 = 256 \times h$

or, $h = \frac{1536}{256}$

$\therefore h = 6cm$

Thus, The vertical height of a square based pyramid is 6cm.

(c) Here,
The total surface area of the pyramid (TSA) = $2al + a^2$
For calculate slant height (l),

We have the relation,

$$l^2 = h^2 + \left(\frac{a}{2}\right)^2$$

or, $l^2 = 6^2 + 8^2$

or, $l = \sqrt{36+64}$

or, $l = \sqrt{100}$

$\therefore l = 10\text{cm}$

Now,

$TSA = 2 \times 16 \times 10 + 16^2$

$= 320 + 256$

$= 576\ \text{cm}^2$

Thus, the total surface area of the square pyramid is 576cm^2.

Q.N.6 Ans →

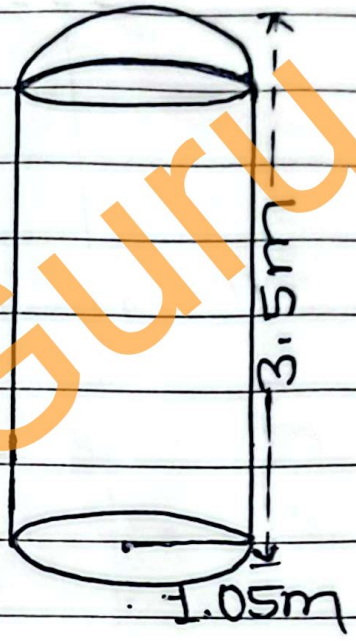
Solⁿ.

(a) There are two curved surface in a combined solid made of a cylinder and a hemisphere.

(b) Here,

Radius of base (r)
$= 1.05m$

Height of cylinder (h)
$= 3.5m - 1.05m$
$= 2.45m$



Now,
The volume of the combined solid (V)

$= \pi r^2 h + \frac{2}{3}\pi r^3$

$= \frac{22}{7} \times 1.05 \times 1.05 \times 2.45 + \frac{2}{3} \times \frac{22}{7} \times 1.05 \times 1.05 \times 1.05$

$= 8.4892 + 2.425$

$= 10.91475\ m^3$

Thus,
the volume of the tank is $10.91475\ m^3$ Ans

(c) Here,
Total capacity of the tank
$= 10.91475 \times 1000$ libres
$= 10914.75$ libres.

Thus, there are 10914.75 l of water contained in the tank.

Q.N. 7 Ans,
Sol^{n},
(a) Here,
length (l) = 16 ft
breadth (b) = 12 ft
height (h) = 9 ft
Now,
The area of floor (A)
$= l \times b$
$= 16\text{ ft} \times 12\text{ ft}$
$= 192\text{ ft}^2$.
Also,
The cost of 1 ft^2 carpenting
= Rs. 300

∴ The cost of 192 ft^2 carpenting
= RS. 300 × 192
= RS. 57600

(b) Here,
There are 2 windows of (4×4) ft^2 area and 1 door of (6×2) ft^2.
Now,
The area of four wall & ceiling of the room excluding windows and door

= 2h(l+b) + l×b − (Area of window + door)

= 2×9(16+12) + 16×12 − [(4×4)×2 + 6×2]

= 504 + 192 − 44

= 652 ft^2

Total cost of colouring = RS. 19560
Now,
The rate of colouring per square feet = RS. $\frac{19560}{652}$

$= Rs.30 \text{ per } ft^2$

Thus, the rate of colouring per sq. feet is Rs.30.

Q.N.8 Ans

Sol^n.

(a) Mean in arithmetic series is defined as the sum of all the terms divided by the no. of terms.

i.e. $\text{Mean} = \frac{a+l}{2}$

Where, a = first term

l = last term

(b) Here,

Given, In A.S.,

$1000 + 2000 + 3000 + \ldots$ 10^{th} term

First term $(a) = Rs.1000$

Common difference $(d) = Rs.2000 - Rs.1000$

$= Rs.1000$

No. of terms (n) = 10
Sum of 1st 10th terms (S_{10}) = ?
We have,

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

or, $S_{10} = \frac{10}{2}[2 \times 1000 + (10-1) \times 1000]$

$= 5[2000 + 9000]$

$= Rs. 55000$

Thus, Rs. 55000 is deposited upto 10th birthday.

(c) Here,

$$S_{11} = \frac{11}{2}[2 \times 1000 + (11-1) \times 1000]$$

$= \frac{11}{2}[2000 + 10000]$

$= Rs. 66000$

Yes, Rs.66,000 is deposited on Aashish account by 11th birthday.

(d) Here, $a = Rs.\ 1000$, $d = Rs.\ 1000$
$S_n = Rs.\ 1,05,000$
$n = ?$
We have;

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

$$\text{or, } 105000 = \frac{n}{2}[2\times1000 + (n-1)\times1000]$$

$$\text{or, } 105000\times2 = n[2000 + 1000n - 1000]$$

$$\text{or, } n(1000 + 1000n) = 105000\times2$$

$$\text{or, } n\times1000(1+n) = 105000\times2$$

$$\text{or, } n + n^2 = \frac{105\cancel{000}\times2}{1\cancel{000}}$$

$$\text{or, } n^2 + n = 210$$

$$\text{or, } n^2 + n - 210 = 0$$

or, $n^2 + 15n - 14n - 210 = 0$

or, $n(n+15) - 14(n+15) = 0$

or, $(n+15)(n-14) = 0$

Either,

$\Rightarrow n+15 = 0$
$\therefore n = -15$
(-ve impossible)

$\Rightarrow n-14 = 0$
$\therefore n = 14$

Thus, In 14 years, will Rs. 105000 be deposited in his account.

Q.N. 9 Ans

Sol^n.

(a) The standard form of quadratic equation is

$$ax^2 + bx + c = 0 \; ; \; a \neq 0$$

(b) Here,
Length(l) = $2x$ ft
breadth(b) = x ft (let)
The area of the field (A) = $l \times b$
or, $800 = 2x \times x$
or, $2x^2 = 800$
or, $x^2 = 400$
or, $x = \sqrt{400}$
$\therefore x = 20$ ft
Now,
The perimeter of the field (P)
$= 2(l+b)$
$= 2(2x+x)$
$= 2 \times 3x$
$= 2 \times 3 \times 20$
$= 120$ ft
Thus, the required wire is 120 feet.

Q. N. 10 Ans.

Sol^{n}:

(a) Here,

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

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

$$= \frac{x}{y(x-y)} - \frac{y}{x(x-y)}$$

$$= \frac{x \times x - y \times y}{xy(x-y)}$$

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

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

$$= \frac{(x+y)}{xy} \quad \text{Ans}$$

(b) Here,

$$2^x + \frac{16}{2^x} = 10$$

Let $2^x = a \longrightarrow (1)$

Then,

$$a + \frac{16}{a} = 10$$

or, $a^2 + 16 = 10a$

or, $a^2 - 10a + 16 = 0$

or, $a^2 - 8a - 2a + 16 = 0$

or, $a(a-8) - 2(a-8) = 0$

or, $(a-8)(a-2) = 0$

Either,

$\Rightarrow a - 8 = 0$
$\therefore a = 8$

$\Rightarrow a - 2 = 0$
$\therefore a = 2$

Now, from eqn. (1)

$\Rightarrow 2^x = a$
or, $2^x = 8$
or, $2^x = 2^3 \therefore x = 3$

$\Rightarrow 2^x = a$
or, $2^x = 2^1$
$\therefore x = 1$

Hence, $x = 1$ or 3 Ans

Q.N. 11 Ans,

Sol^{n}.

(a) Here,
The relation bet^{n}. the areas of $\square PQRS$ and $\square PQVT$ are equal to each other.

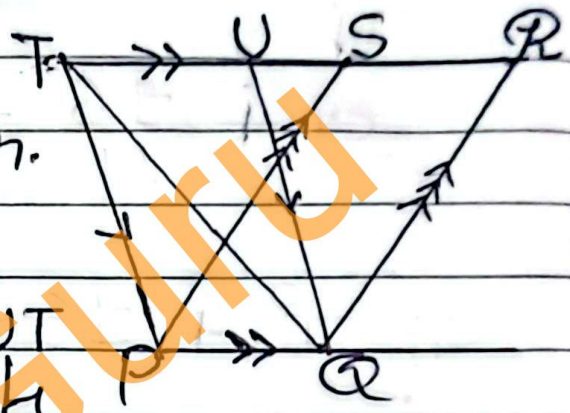


Fig (Q.N. b)

(b) Here,
Given :- parallelogram PQRS and $\triangle PQT$ are standing on the same base PQ and lying between the same parallel PQ and TR.

To be proved :- Area of $\triangle PQT$ $= \frac{1}{2}$ area of $\square PQRS$.

proof:

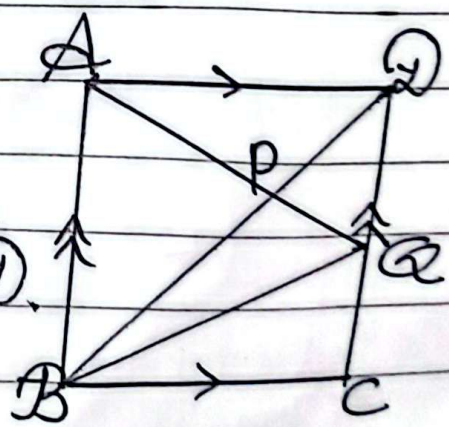
Statements	Reasons
1. Area of □ PQUT = Area of □ PQRS	1. Both being on the same base PQ and PQ ∥ TR.
2. Area of △PQR = $\frac{1}{2}$ Area of □PQUT	2. Diagonal QT bisects the □ PQUT.
3. Area of △PQR = $\frac{1}{2}$ Area of □PQRS	3. From (1) and (2).

Conclusion:- The area of △PQT is half of the area of □PQRS.

Hence, proved

(c) Here,

Given: ABCD is a parallelogram, where AB ∥ BC and AB ∥ CD. BD is a diagonal.



To be proved: Area of △APD = Area of △BPQ

proof:

Statements	Reasons
1. Area of ΔABD = Area of ΔABQ	1. Both triangles lie on same base.
2. Area of ($\Delta ABD - \Delta ABP$) = Area of ($\Delta ABQ - \Delta ABP$)	2. Subtracting equal areas from equal areas.
3. Area of ΔAPD = Area of ΔBPQ	3. From (1) and (2)

Conclusion: Hence, the area of ΔAPD is equal to the area of ΔBPQ.

proved

Q.N. 12. Ans

Sol^{n}.

(a) **Inscribed angle**

The angle formed by joining two chords of a circle at the circumference is called inscribed angle. It is also known as circumference angle.

(b) Here,

In the given figure,

$\angle ZOP = (9x+2)^\circ$

$\angle ZMP = (4x+5)^\circ$

We know,

$\angle ZOP = 2\angle ZMP$ [$\because$ The central angle is double of the inscribed angle at the same arc]

or, $(9x+2)^\circ = 2 \times (4x+5)^\circ$

or, $9x+2 = 8x+10$

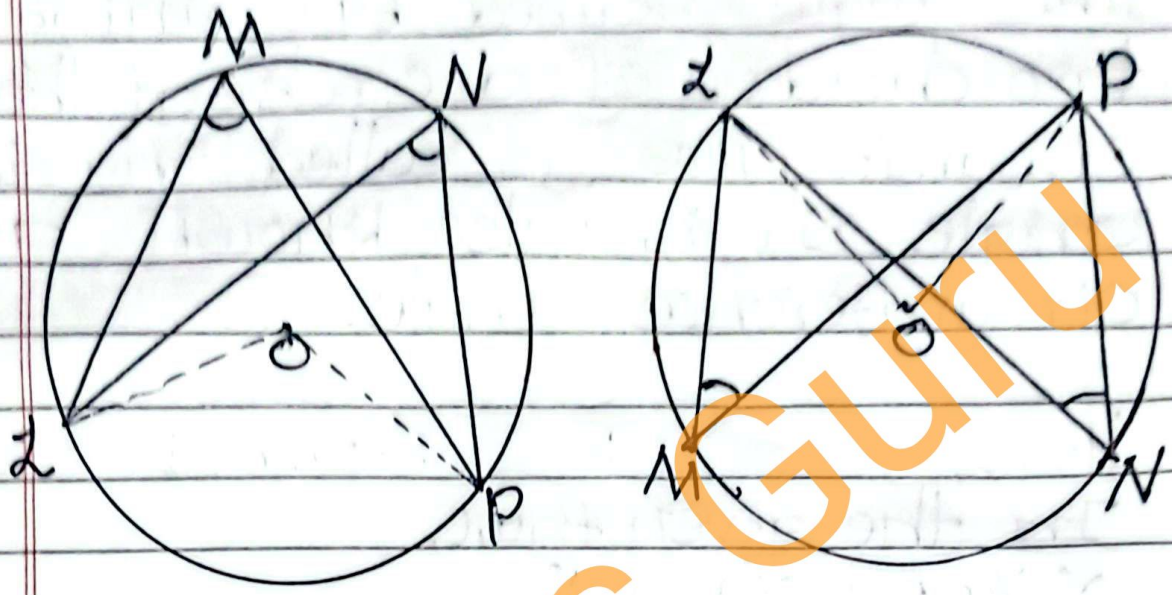
or, $9x-8x = 10-2$

$\therefore x = 8^\circ$

Thus, the value of x is 8°

(c) Sol^{n}.

Given: We draw two figure with different measurement.



To be prove: - $\angle LMP = \angle LNP$

Observation Table

Figure	$\angle LMP$	$\angle LNP$	Result
(a)	60°	60°	$\angle LMP = \angle LNP$ = 60°
(b)	40°	40°	$\angle LMP = \angle LNP$ = 40°

Conclusion: Hence, the inscribed angle LMP and LNP are equal.

Proved

Q.N. 13 Ans

Sol^{n}.

(a) Here,

Given,

$PQ = 5.4cm$

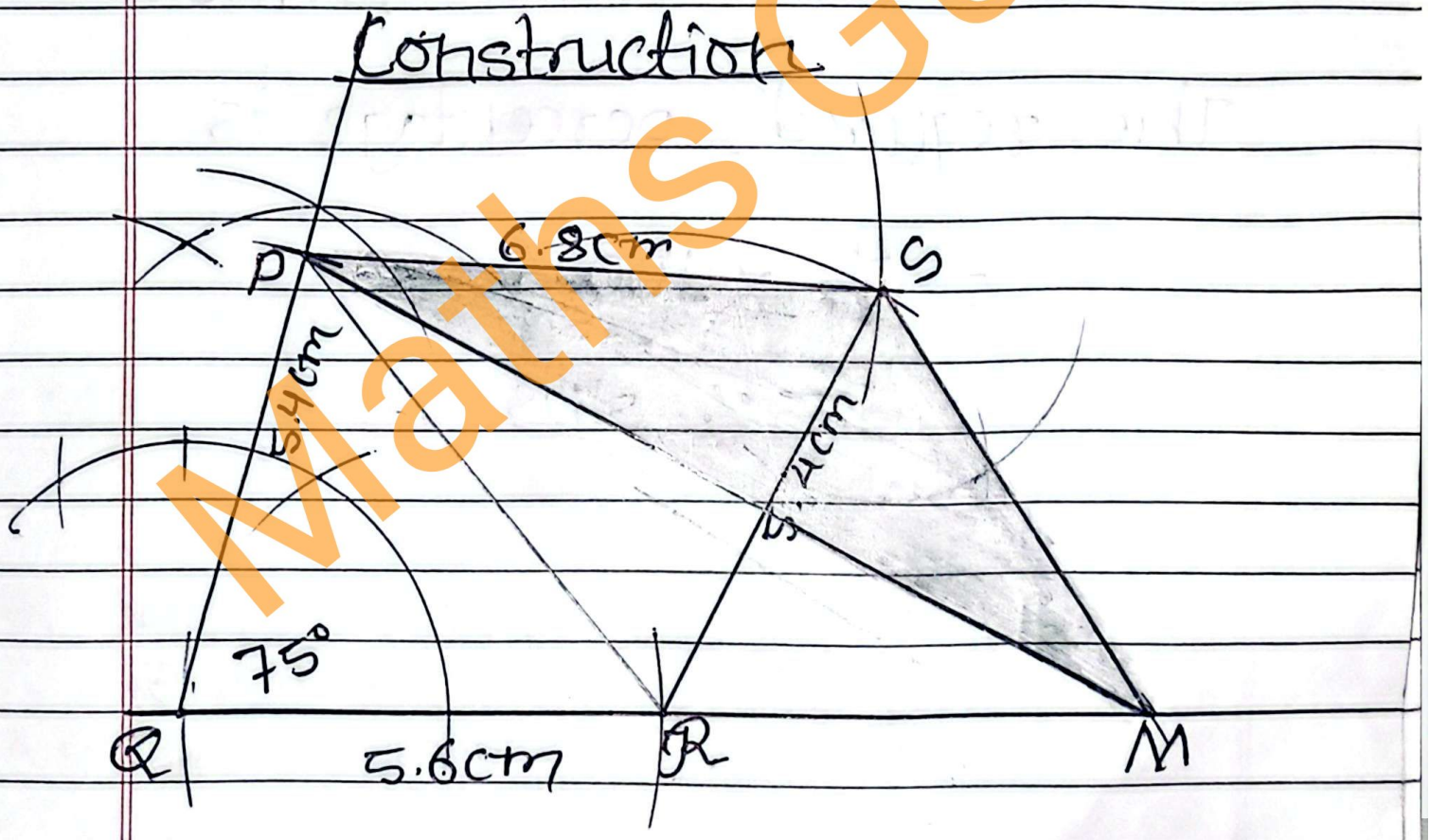
$QR = 5.6cm$

$RS = 5.4cm$

$SP = 6.8cm$

$\angle PQR = 75°$

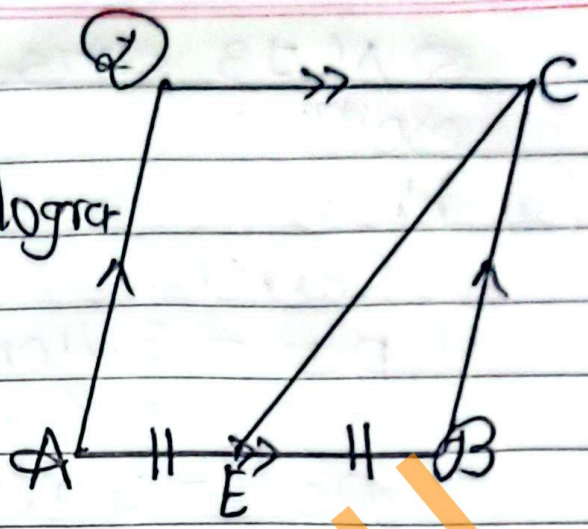
Construction



We construct the ΔPSM equal to area of the quadrilateral PQRS.

(b) Sol^{n}.

Given,
ABCD is a parallelogram, where AE = BE.
Since, E be the midpoint of AB.
Now,



Area of Δ BEC $= \frac{1}{4}$ x area of $\square$ABCD

The required percentage is

$= \frac{1}{4} \times 100\%$

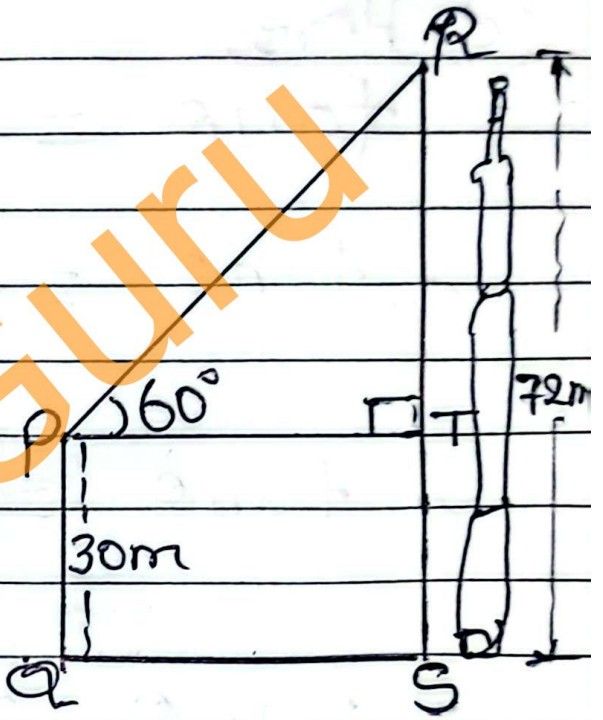
$= 25\%$. Ans

Q.N. 14 Ans

Sol^{n}

(a) $\angle RPT$ is the angle of elevation of top of tower as observed from the roof of the house.

(b) Here,
$RS = 72m$
$PQ = TS = 30m$
Now,
The value of TR is $= RS - PQ$
$= 72m - 30m$
$= 42m$



(c) Here,
$\angle RPT = 60°$
$TR = 42m$
$PT = ?$
We have,
$\tan 60° = \frac{TR}{PT}$

or, $\sqrt{3} = \frac{42}{PT}$

or, $PT = \frac{42}{\sqrt{3}}$

$\therefore PT = 14\sqrt{3}$ m

Thus, the distance between the house and tower is $14\sqrt{3}$ m.

(d) Here,

$$\tan\theta = \frac{72-28-30}{14\sqrt{3}}$$

$$\text{or, } \tan\theta = \frac{14}{14\sqrt{3}}$$

$$\text{or, } \tan\theta = \frac{1}{\sqrt{3}}$$

$$\text{or, } \tan\theta = \tan 30^\circ$$

$$\therefore \theta = 30^\circ,$$

Yes, the angle of depression of 30° formed.

Q.N. 15 Ans

Sol^{n}.

(a) Here,
Median (Md) = 29

∴ The median class is 20-30.

(b) Here,
Md = 29

C.I.	f	cf
0-10	3	3
10-20	7	10
20-30	10	20
30-40	x	20+x
40-50	10	30+x
	N = 30+x	

The position of median
= (20-30)

Now,
l = 20
f = 10
cf = 10
h = 10

We know that,

$$M_d = l + \frac{\frac{N}{2} - cf}{f} \times h$$

or, $29 = 20 + \frac{\frac{30+x}{2} - 10}{10} \times 10$

or, $29 - 20 = \frac{30 + x - 20}{2}$

or, $9 \times 2 = 10 + x$

or, $x = 18 - 10$

$\therefore x = 8$

Thus, the value of x is 8.

(c) Here,

C.I.	f	m	fm
0-10	3	5	15
10-20	7	15	105
20-30	10	25	250
30-40	8	35	280
40-50	10	45	450
	N = 38		Σfm = 1100

Now,

$$\text{Mean}(\bar{x}) = \frac{\Sigma fm}{N}$$

$$= \frac{1100}{38}$$

$$= 28.94$$

(d) Here,

The no. of students who obtaining less than 20 marks

$= 3 + 7$

$= 10$

The no of students who obtaining 20 or more than 20 marks

$= 10 + 8 + 10$

$= 28$

The ratio of students obtaining marks less than 20 and 20 or more than 20 is

$= 10 : 28$

$= 5 : 14$ Ans

Q.N.26 Ans

Sol^{n}.

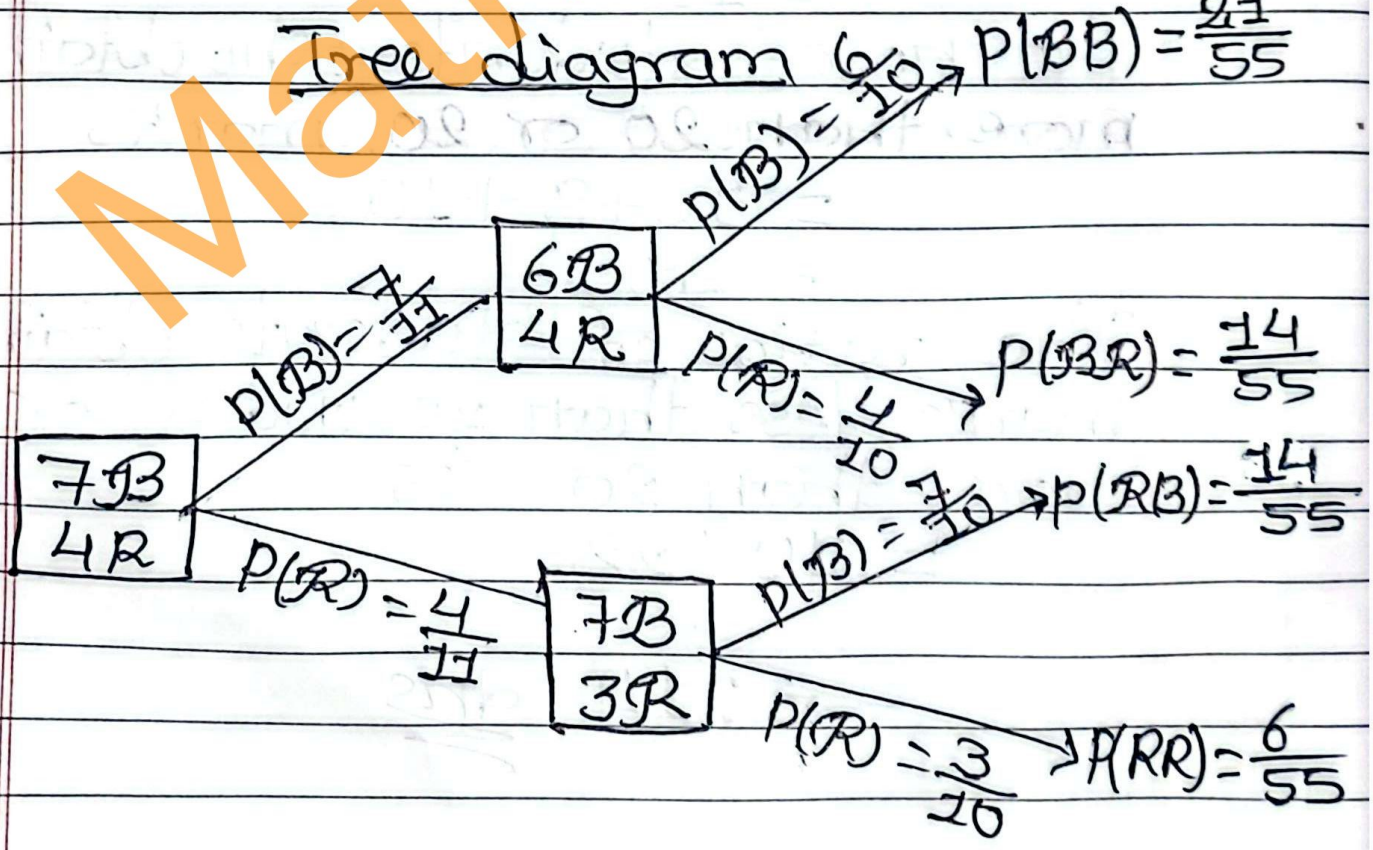
(a) If B and R be two independent events then,

$$P(B \cap R) = P(B) \times P(R)$$

(b) Here,
Let B be the black ball and R be the red ball.

$$n(B) = 7$$
$$n(R) = 4$$

Tree diagram



(c) Here,
The probability of getting both black balls is

$$P(BB) = \frac{7}{11} \times \frac{6}{10} = \frac{21}{55}$$

(d) Here,
The probability of getting both red balls is

$$P(RR) = \frac{4}{11} \times \frac{3}{10} = \frac{6}{55}$$

So,
P(RR) is less than P(BB) by

$$= \frac{21}{55} - \frac{6}{55}$$

$$= \frac{21-6}{55}$$

$$= \frac{15}{55}$$

$$= \frac{3}{11}$$ Ans

Thank You!!!