Sub :- Maths

SEE Maths 2081 (2025)

Karnali province [RE-1081 Kap]

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Answer Sheet

Q.N.1 Ans,

Sol^n.

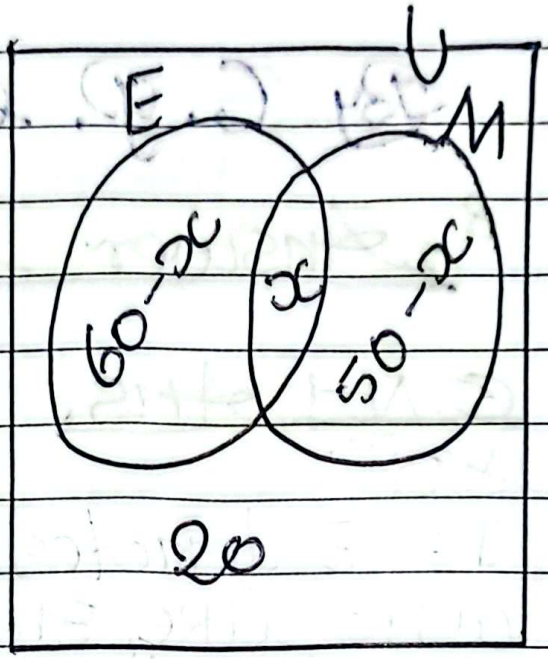
(a) If E denotes the students who like English and M denotes the students who like mathematics.
Then,
The set of students who did not like any of these two subjects in the cardinality notation is
$= n(\overline{E \cup M})$

(b) Here,
$n(U) = 100$
$n(E) = 60$
$n(M) = 50$

$n(\overline{E \cup M}) = 20$

$n(E \cap M) = ?$ (x let)

Showing it in a Venn diagram,



(c) Here,
From Venn diagram,

$60 - x + x + 50 - x + 20 = 100$

$\Rightarrow 130 - x = 100$

$\Rightarrow x = 130 - 100$

$\therefore x = 30$

So, $n(E \cap M) = 30$

Now,
The number of students who liked exactly one subject is

$= n_0(E) + n_0(M)$

$= (60 - x) + (50 - x)$

$= (60 - 30) + (50 - 30)$

$= 30 + 20$

$= 50$ Ans

(d) Here,
$n(\overline{E \cup M}) = 30$
Then,
$n(E \cap M)$ is increased by 10.

P.T.O

Q. N. 2. Ans

Sol^{n}

(a) The formula to calculate annually compound interest is

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

(b) Here,
principal (p) = Rs. 1,00,000
Rate of interest (R) = 8% p.a.
Time (T) = 2 years
Semi-annual C.I. = ?
We know that,

$$SCI = p\left[\left(1+\frac{R}{200}\right)^{2T}-1\right]$$

$$= 100000\left[\left(1+\frac{8}{200}\right)^{2\times 2}-1\right]$$

$$= 100000\left[(1.04)^{4}-1\right]$$

$$= 100000\left[1.1698-1\right]$$

$$= 100000 \times 0.1698$$

$= RS.\ 16985.86$

Thus,
Aashlal receives RS. 16985.86 interest in 2 years.

(C) Here,
Annual compound interest in 2 years is

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

$$= 100000\left[\left(1+\frac{8}{100}\right)^2 - 1\right]$$

$$= 100000\left[(1.08)^2 - 1\right]$$

$$= 100000 \times 0.1664$$

$$= RS.\ 16640$$

Thus,
The bank provides yearly compound interest, it will be loss by

$= RS.\ (16985.86 - 16640)$

$= RS.\ 345.86$

Q.N. 3 Ans,

Sol^{n}.

(a) Here,
Initial population (P) = 10000
population growth rate(R) = 4%.
Now,
population after 1 year is

$$P_T = P\left(1+\frac{R}{100}\right)^T - 100$$

$$= 10000\left(1+\frac{4}{100}\right)^1 - 100$$

$$= 10000 \times 1.04 - 100$$

$$= 10400 - 100$$

$$= 10,300$$

Thus,
the population of the village after one year = 10300

6) Here,
$P = 10300$
$T = 1$ yr
$R = 4\%$.
Now,
The population after 1 year

$$= 10300\left(1+\frac{4}{100}\right)^1$$

$$= 10300 \times 1.04$$

$$= 10712.$$

Thus,
the population of the village after 2 years $= 10712$.

(c) Here,
The population after 2 yrs., if nobody was migrated

$$= 10000\left(1+\frac{4}{100}\right)^2$$

$$= 10000 \times (1.04)^2$$

$= 10000 \times 1.0816$

$= 10816$

Thus,
The difference in population is
$= 10816 - 10712$
$= 104$ Ans

Q.N. 4 Ans →
Sol^n.

(a) Currency exchange means converting the money of one country into the money of another country.

(b) Here,
$\$1 = ₹ 138.83$
So,
$\$1500 = NRS.\ 138.83 \times 1500$
$= NRS.\ 208245$
Thus,
We can exchange Rs. 208245 with $1500.

(c) Here,
$1 = NRS. 138.83
After 2% devaluated in Nepali currency,

$1 = 138.83 + 2% of 138.83

$= 138.83 + \frac{2}{100} \times 138.83$

$= 138.83 + 2.7766$

$= NRS. 141.6066$

Now,
$1 = NRS. 141.6066

$NRS. 1 = \$ \frac{1}{141.6066}$

$\therefore NRS. 708033 = \frac{1}{141.6066} \times 708033$

$= \$5000$

Thus,
After devaluation, $5000 can be exchanged with NRS. 708033.

Q.N.5 Ans,

Sol^{n}.

(a) The relation of HD and EF is

$$HD = \frac{1}{2} \text{ of } EF$$

(b) Here, AH = 26cm, AD = 24cm

$$EF = 2\sqrt{(AH)^2 - (AD)^2}$$

$$= 2\sqrt{26^2 - 24^2}$$

$$= 2\sqrt{676 - 576}$$

$$= 2\sqrt{100}$$

$$= 2 \times 10$$

$$= 20 \text{ cm}$$

Thus,

the value of EF is 20cm

(c) Here,
$a = 20\ cm$
$l = 26\ cm$
Now,
The total surface area of pyramid (TSA) is

$$= 2al + a^2$$

$$= 2 \times 20 \times 26 + 20^2$$

$$= 1040 + 400$$

$$= 1440\ cm^2.$$

Q.N. 6 Ans
Sol^n.

(a) The formula to calculate the volume of solid object is

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

b) Here,
Circumference (C) $= 2\pi r$
$44 = 2\pi r$

or, $r = \frac{44}{2\pi}$

$\therefore r = 7\text{cm}$
Now,
The volume of hemisphere (V_1)
$= \frac{2}{3}\pi r^3$
$= \frac{2}{3} \times \pi \times 7^3$
$= \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7$
$= 718.67\ \text{cm}^3$

(c) Here,
Height of cylinder (h) $= (17-7)\text{cm}$
$= 10\text{cm}$
Radius (r) $= 7\text{cm}$
Now,
The volume of cylinder (V_2)
$= \pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 10$

$= 1540 \text{ cm}^3$

Also,
Difference in volume (V)
$= V_2 - V_1$
$= (1540 - 718.67) \text{ cm}^3$
$= 821.33 \text{ cm}^3$

Thus,
the volume of cylinder is more than the volume of hemisphere.

Q.N. 7 Ans

Sol^{n}.

(a) Here,
The capacity of water tank
$= 5\text{m} \times 1\text{m} \times 4\text{m}$
$= 20\text{m}^3$
$= 20 \times 1000 \text{ l} \quad [\because 1\text{m}^3 = 1000\text{l}]$
$= 20,000$ litre
Rate of filled water = Rs. 0.50/l
Now,
Total cost $= 20000 \times 0.50$

$= Rs.10,000$

Also, The cost of one family of water

$= \frac{Rs.10000}{20}$

$= Rs.500$

The cost of water in 1 year

$= Rs.500 \times 12$

$= Rs.6000$

Thus,

Rs.6000 should be pay by one family in 1 year.

(b) New capacity of tank $= 6m \times 2m \times 5m$

$= 60m^3$

$= 60,000$ litre

The capacity of tank will be increased to 3 times.

Q.N.8 Ans

Sol^{n}.

(a) In geometric sequence is the child learning words.

(b) Here,

First term (a) = 3

No. of terms (n) = 8

Common ratio (r) = $\frac{6}{3} = \frac{12}{6}$

$= 2$

where, $r > 1$

So,

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$= \frac{3(2^8 - 1)}{2 - 1}$$

$$= \frac{3(256 - 1)}{1}$$

$$= 765$$

Thus,

the child learn 765 words upto 8 days.

(c) Here, $a = 3$

$S_n = 6141$

$n = ?$

$r = 2$

Now,

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$\text{or, } 6141 = \frac{3(2^n - 1)}{2 - 1}$$

$$\text{or, } 6141 = \frac{3(2^n - 1)}{1}$$

$$\text{or, } 2^n - 1 = \frac{6141}{3}$$

$$\text{or, } 2^n = 2047 + 1$$

$$\text{or, } 2^n = 2048$$

$$\text{or, } 2^n = 2^{11}$$

$\therefore n = 11$

Thus,

In 11 days will the child learn 6141 words.

Q. N. 9 Ans

Sol^{n}.

(a) Here,
The required two digits number
$= 10x + y$

(b) Here,
From the given conditions,
$10x + y = 3(x + y) \longrightarrow (1)$ and
$10x + y = 3xy \longrightarrow (2)$
Now,
From eq^{n}. (1),
$10x + y = 4x + 4y$
or, $10x - 4x = 4y - y$
or, $6x = 3y$

$\therefore y = 2x \longrightarrow (3)$
Also,
From eq^{n}. (2) and (3), we get

$10x + 2x = 6x^2$
or, $12x = 6x^2$
or, $6x^2 - 12x = 0$
$\therefore x^2 - 2x = 0 \longrightarrow (4)$
This eq^{n}. (4) is the required quadratic eq^{n}.

(c) Here,

$x^2 - 2x = 0$

$x(x-2) = 0$

Either,

$\Rightarrow x = 0$ (Not possible)

$\Rightarrow x - 2 = 0$

$\therefore x = 2$

Now,

Substituting the value of x in $y = 2x$, we get

$\therefore y = 2 \times 2$

$= 4$

Thus,

the required number is

$= 10x + y$

$= 10 \times 2 + 4$

$= 20 + 4$

$= 24$ Ans.

Q.N. 10 AHS,

Sol^{n}.

(a) Here,

$$\frac{1}{b-1} - \frac{1}{b+1}$$

$$= \frac{1 \times (b+1) - 1 \times (b-1)}{(b+1)(b-1)}$$

$$= \frac{b+1-b+1}{b^2-1^2}$$

$$= \frac{2}{b^2-1} \text{ AHS}$$

(b) Here,

$$7^x + 7^{-x} = 7\frac{1}{7}$$

or, $$7^x + \frac{1}{7^x} = \frac{50}{7}$$

Let, $7^x = a \rightarrow (1)$

Then,

$$a + \frac{1}{a} = \frac{50}{7}$$

or, $\frac{a^2+1}{a} = \frac{50}{7}$

or, $7a^2 - 50a + 7 = 0$

or, $7a^2 - (49+1)a + 7 = 0$

or, $7a^2 - 49a - 1a + 7 = 0$

or, $7a(a-7) - 1(a-7) = 0$

or, $(a-7)(7a-1) = 0$

Either,

$\Rightarrow a - 7 = 0$

$\therefore a = 7$

$\Rightarrow 7a - 1 = 0$

$\therefore a = \frac{1}{7}$

Now,

From eqn (1)

$\Rightarrow 7^x = 7^1$

$\therefore x = 1$

$\Rightarrow 7^x = \frac{1}{7}$

or, $7^{x} = 7^{-1}$

$\therefore x = -1$

Hence,

$x = \pm 1$ Ans

Q.N. 11 Ans

Sol^{n}.

(a) Here,

The area of ΔAPQ = The area of ΔBPQ

[$\because$ ΔAPQ and ΔBPQ are standing on same base PQ & AB || PQ]

(b) Here,

AB = 10cm

PQ = 8cm

Now,

The area of ΔAPB is

$= \frac{1}{2} \times AB \times PQ$

$= \frac{1}{2} \times 10 \times 8$

$= 40 cm^2$

Q.N. 12 AMS

Sol^{n}.

(a) Here

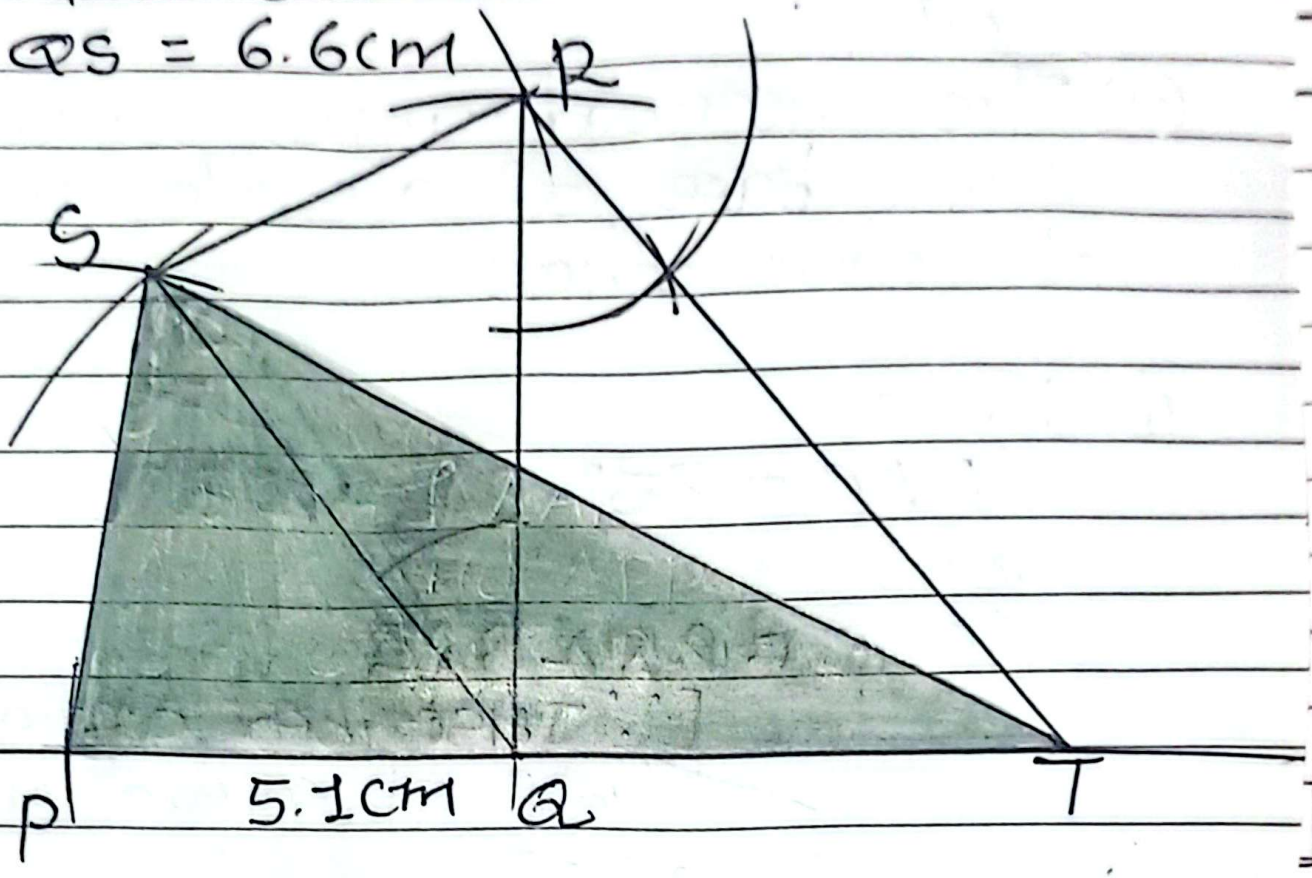
PQ = 5.1cm

QR = 7cm

RS = 4.6cm

SP = 5.4cm

QS = 6.6cm



We construct ΔPST which is equal to the area of $\square PQRS$.

(b) The areas of ΔPST and $\square PQRS$ so constructed are equal because diagonal QS divides $\square PQRS$ into two equal parts and

those triangles to the same base PS while constructing ΔPST

Q.N. 13 Ans

Sol^{n}.

(a) The inscribed angles standing on same arc of a circle are equal to each other.

(b) Here,

$\angle BAC = 35°$

Now,

$\angle BOC = 2 \times \angle BAC$

[$\because$ Inscribed angle is half of central angle]

$= 2 \times 35°$

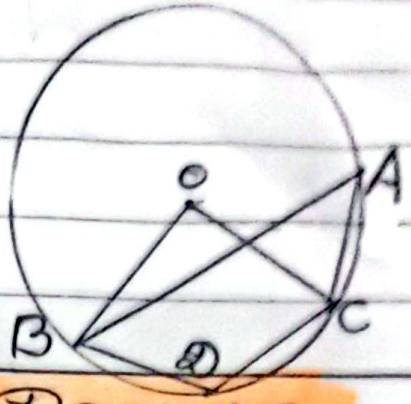
$= 70°$ Ans

Thus, the value of $\angle BOC$ is $70°$.

(c) Here,

Given :- Arc. BDC = Arc. ACD

To prove :- AB || CD



Proof :-

Statements	Reasons
1 Arc. BDC = Arc. ACD	1. Given
2. $\overline{BD} + \overline{DC} = \overline{AC} + \overline{CD}$	2. Sum of arc. along the circle.
3. $\overline{BD} + \overline{CD} = \overline{AC} + \overline{CD}$	3. $\overline{CD} = DC$
4. $\overline{BD} = \overline{AC}$	4. Subtracting CD from both sides.
5. AB || CD	5. Chords are parallel if they cut in equal arc.

Conclusion :- AB || CD

Hence, proved

(d) Here,

Given:- We draw two figures of different measurement.

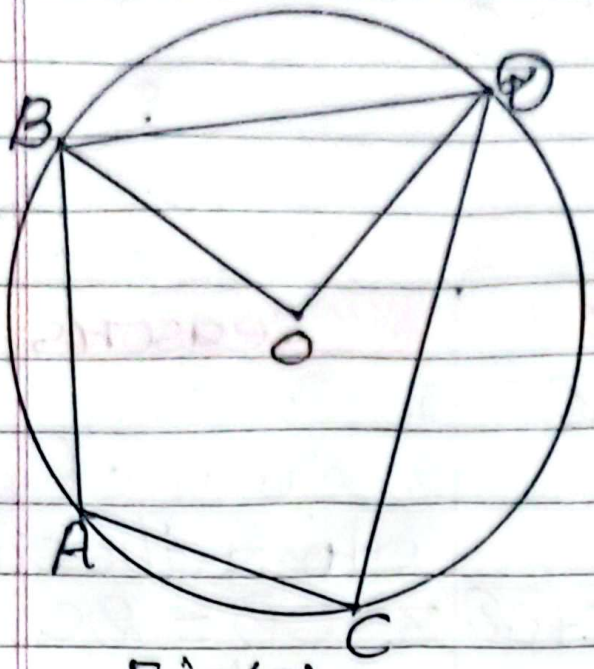


Fig.(a)

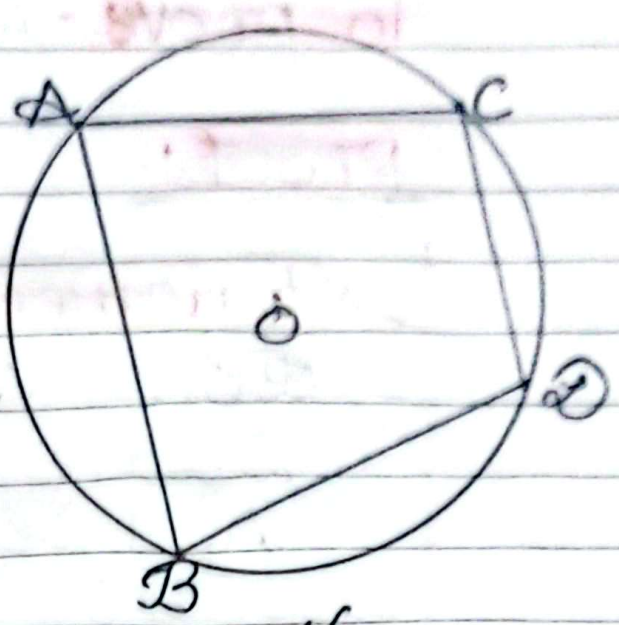


Fig.(b)

To prove:- $\angle BAC + \angle BDC = 180^\circ$

Observation Table

Fig.	$\angle BAC$	$\angle BDC$	Result
(a)	112°	68°	$\angle BAC + \angle BDC = 112^\circ + 68^\circ = 180^\circ$
(b)	78°	102°	$\angle BAC + \angle BDC = 78^\circ + 102^\circ = 180^\circ$

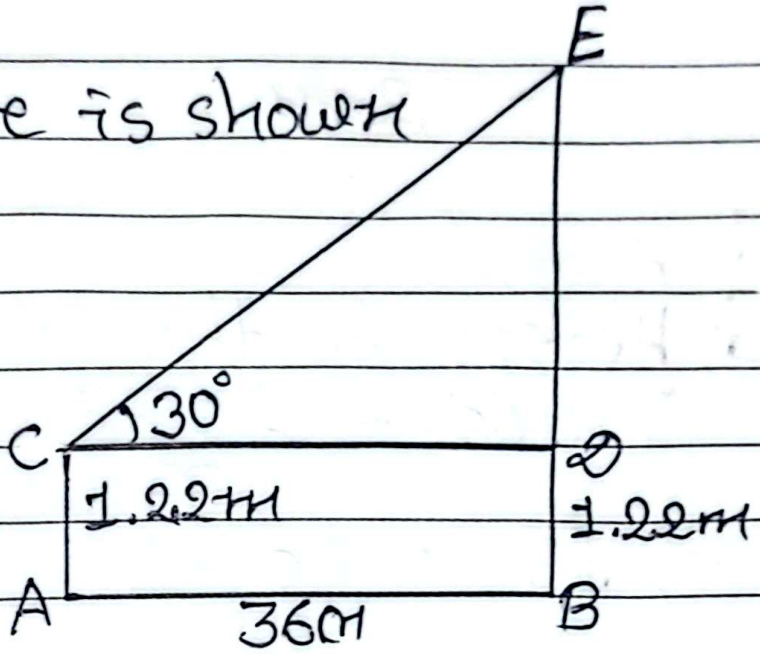
Conclusion:- Hence, from the above experiment, $\angle BAC$ and $\angle BDC$ are supplementary.

Q.N. 14 AHS

Sol^{n}.

(a) This is called angle of elevation.

(b) Here,
The figure is shown below:-



(c) Here,
$BD = AC = 1.22m$
$AB = CD = 36m$
Now,
$\tan 30° = \frac{DE}{CD}$

or, $\frac{1}{\sqrt{3}} = \frac{DE}{36}$

or, $DE = \frac{36}{\sqrt{3}}$

$\therefore DE = 20.78m$

So, The height of school building is

$= BQ + QE$

$= (1.22 + 20.78)m$

$= 22m$

(d) Here,

Let, x be the required distance.

$\tan 60° = \frac{20.78}{x}$

or, $\sqrt{3} = \frac{20.78}{x}$

or, $x = \frac{20.78}{\sqrt{3}}$

$\therefore x = 12m$

Thus, Himali should walk $(36 - 12)m$ $= 24m$ near from that place.

Q.N. 15 AHS

Sol^{n}.

(a) C.f. denotes cumulative frequency of preceding Q_1 class.

(b) Here,

Frequency Table

C.I	f	m	fm	Cf
0-4	50	2	100	
4-8	65	6	390	115
8-12	75	10	750	190
12-16	60	14	840	250
16-20	50	18	900	300
	N = 300		Σfm = 2980	

Now

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

$$= \frac{2980}{300}$$

$$= 9.93$$

c) Here,
Median class $= \left(\frac{N}{2}\right)^{th}$ obs.

$= \left(\frac{300}{2}\right)$

$= 150^{th}$ obs.

$= (8-12)$

Now,
$l = 8$
$f = 75$
$cf = 115$
h or $i = 4$

We have,
$$M_d = l + \frac{\frac{N}{2} - cf}{f} \times i$$

$$= 8 + \frac{150-115}{75} \times 4$$

$$= 8 + \frac{35}{75} \times 4$$

$$= 8 + 1.87$$

$$= 9.87$$

(d) Here,
No. of students who obtained more marks than median class
$= 60 + 50$
$= 110$
Now,
The required percentage is

$$= \frac{110}{300} \times 100\ \%$$

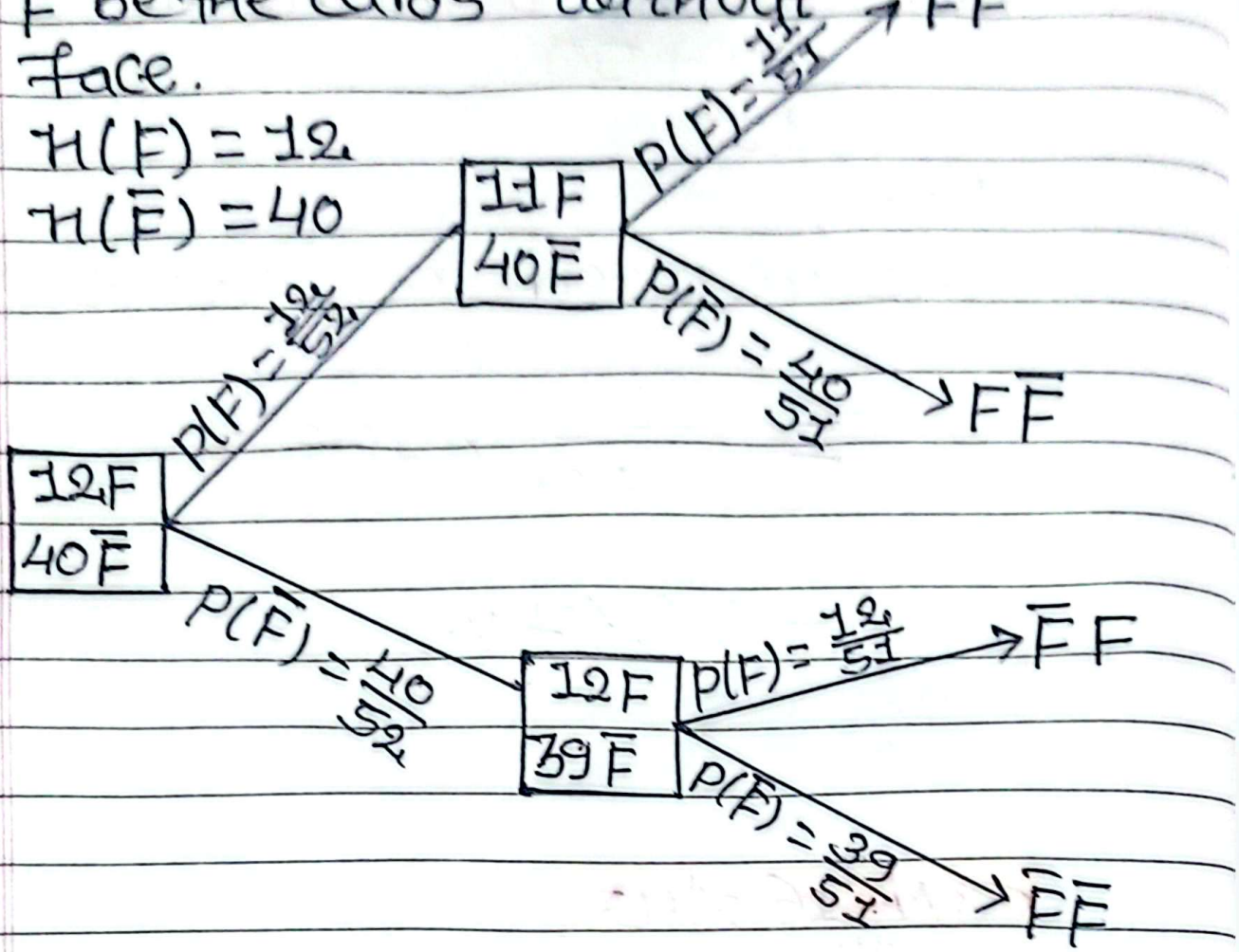
$$= 36.67\ \%$$

Q.N. 16 Ans

(a) Here,
The multiplicative law of probability is

$P(A \cap B) = P(A) \times P(B)$ with A and B independent events.

(b) Here,
Let, F be the cards with face and $\bar{F}$ be the cards without face.
$n(F) = 12$
$n(\bar{F}) = 40$



(c) Here,
The probability of getting both face cards, $P(FF) = \frac{12}{52} \times \frac{11}{51}$

$= \frac{11}{221}$

The probability of not getting both face cards, $P(\bar{F}\bar{F}) = \frac{40}{52} \times \frac{39}{51}$

$= \frac{10}{17}$

Now,

$$P(FF) : P(\bar{F}\bar{F}) = \frac{11}{221} : \frac{10}{17}$$

$$= \frac{11}{221} \times \frac{17}{10}$$

$$= \frac{11}{130}$$

$$= 11 : 130 \text{ Ans}$$

The End