PO. RALG

LOMADO DISTRICT COUNCIL

BASIC MATHEMATICS M.S. FIII.

1c Given 0.441441

Let $x = 0.441441$ —(i) —ook

Then multiply by 1000 since 441 repeated.

$1000x = 441.441$ —(ii) —ook

Then, substract equation (ii) − equation (i)

$1000x - x = 441.441 - 0.441$ —ook

$\frac{999x}{999} = \frac{441}{999}$ or $\frac{49}{111}$.

$x = \frac{49}{111}$ —ook

b). Given, 20minutes, 25minutes, 30minutes

Required to find Lowest common factor

2	20	25	30
2	10	25	15
3	5	25	15
5	5	25	5
5	1	5	1
	1	1	1

—ook

Then the Lcm is $2 \times 2 \times 3 \times 5 \times 5$ —ook

The Lcm is 300minutes then 5HRS.

then they will ring together at 03:55Pm. —ook.

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3 @ Given $m*n = m+4n$ To find the value of x

$3*(x*1) = 27$.

$m+4n$.

2 @ $\frac{3^{x+2}}{5^{2y-8}} = 2025$

$3^{x+2} \cdot 5^{-(2y-8)} = 5^2 \cdot 3^4$ (0½ Mark)

By Comparison

$3^{x+2} = 3^4$ $\quad x+2 = 4$

$x = 4-2$ (01 Mark)

$x = 2$

$5^{-(2y-8)} = 5^2$ (0½ Mark)

$-2y+8 = 2$

$-2y = 2-8$

$\frac{-2y}{-2} = \frac{-6}{-2}$ $\quad y = 3$ (0½ Mark)

$\therefore x = 2$ and $y = 3$ (0½ Mark)

(b) Rationaling factor is $3\sqrt{2}+2\sqrt{c}$ (0½ Mark)

$\frac{6}{3\sqrt{2}-2\sqrt{c}} \times \frac{3\sqrt{2}-2\sqrt{c}}{3\sqrt{2}+2\sqrt{c}}$ (0½ Mark)

$= \frac{6(3\sqrt{2}-2\sqrt{c})}{(3\sqrt{2}-2\sqrt{c})(3\sqrt{2}+2\sqrt{c})}$ (0½ Mark)

$= \frac{18\sqrt{2}-12\sqrt{c}}{(3\sqrt{2})^2-(2\sqrt{c})^2}$ (0½ Mark)

$= \frac{18\sqrt{2}-12\sqrt{c}}{(9\times 2)-(4\times c)}$ (0½ Mark)

$= \frac{18\sqrt{2}-12\sqrt{c}}{18-4c}$ (0½ Mark)

$= \frac{2(9\sqrt{2}-6\sqrt{c})}{2(9-2c)}$ (0½ Mark)

$\therefore \frac{6}{3\sqrt{2}-2\sqrt{c}} = \frac{9\sqrt{2}-6\sqrt{c}}{9-2c}$

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3 @ Given $m*n = m+4n$ To find the value of x

$3*(x*1) = 27$.

from $m*n = m+4n$.

$3*(x*1) = 27$

let $x*1 = m*n = m+4n$.

Then $x+4x1$

$3*(x+4.)$

$m*n = m+4n = 27$

Then $27 = 3+4(x+4)$

$27 = 3+4x+16$

$27 = 19+4x$

$27-19 = 4x$

$\frac{8}{4} = \frac{4x}{4}$

$x = 2$

The value of $x = 2$

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4 @ Slope of $\overline{AB}$

$M_1 = \frac{y_2 - y_1}{x_2 - x_1}$ (0½ Mark)

$M_1 = \frac{4 - 2k}{k - 3}$ (0½ Mark)

Slope of $y + 3x - 4 = 0$

$y + 3x - 4 = 0$

$y = -3x + 4$

$y = mx + c$ (0½ Mark)

$m_2 = -3$

$M_1 = M_2$ (0½ Mark)

$\frac{4 - 2k}{k - 3} = -3$

$4 - 2k = -3(k - 3)$ (0½ Mark)

$4 - 2k = -3k + 9$

$4 - 9 = -3k + 2k$

$-5 = -k$ (0½ Mark)

$5 = k$.

$\frac{2x}{2} = \frac{3800}{2}$ (0½ Mark)

$x = 1900$ shillings

Cost of each book is 1900 shillings and Cost of each pen is 1000 shillings.

(b) let x represent ~~number~~ Cost of books (0½ Mark)

y represent ~~number~~ Cost of pens (0½ Mark)

$\begin{cases} 2x + 3y = 6800 & \text{—(i)} \\ 6x + 5y = 16400 & \text{—(ii)} \end{cases}$ (0½ Mark)

$\begin{cases} 12x + 18y = 40800 \\ 12x + 10y = 32800 \end{cases}$ (−)

$\frac{8y}{8} = \frac{8000}{8}$ $y = 1000$ shillings (0½ Mark)

from $2x + 3y = 6800$

$2x + 3(1000) = 6800$

$2x + 3000 = 6800$

$2x = 6800 - 3000$ (0½ Mark)

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7 a) Given, Mean = 800,000

3 b). $\mu = \{x : x$ is an integer between 0 and 11$\}$

$A = \{x : 2 < x \leq 9\}$

$B = \{x : 1 \leq x < 10\}$

$\mu = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11\}$ — 001/2

$A = \{3, 4, 5, 6, 7, 8, 9\}$

$B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

Then i) $(A \cup B) = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ — 001

$A \cup B = \{1 \leq x \leq 9\}$

ii) $(A' \cup B') = \cancel{\{0, 10, 11\}}$

Since $A' = \{0, 1, 2, 10, 11\}$. — 001/2

$B' = \{0, 10, 11\}$.

Then $A' \cup B' = \{0, 1, 2, 10, 11\}$. — 001

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5b). Given interior angle $i = 140°$.

To find sides (n)

Since $i + e = 180°$ — 001/2

$140° + e = 180°$

$e = 180° - 140°$

$e = 40°$. — 001/2

Also $e = \frac{360°}{n}$. — 001/2

$40° = \frac{360°}{n}$.

$n = \frac{360°}{40°}$ — 001/2

$n = 9$ — 001

There are 9 side of this polygon.

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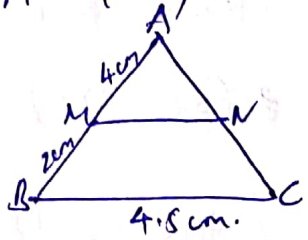
5 @ Given AM = 4cm, MB = 2cm,



i/ To show that $\triangle AMN \sim \triangle ABC$.

Since; $\hat{BAC}$ (is common angle) ——— ½

$A\hat{M}N = A\hat{B}C$ (Alternate angle) ——— ½

$A\hat{N}M = A\hat{C}B$ (Alternate angle) ——— ½

Then $\triangle AMN \sim \triangle ABC$ by AA theorem ——— ½

ii/ To find MN.

from $\frac{\overline{AM}}{\overline{AB}} = \frac{\overline{MN}}{\overline{BC}} = \frac{\overline{AN}}{\overline{AC}}$

$\frac{4cm}{6cm} = \frac{x}{4.5cm}$ (By cross multiplication)

$\frac{4cm \times 4.5cm}{6cm} = \frac{6cm \times x}{6cm}$ ——— ½

$x = \frac{4cm \times 4.5cm}{6cm}$ ——— ½

$x = \frac{18cm}{6}$

$x = 3cm$

Therefore the value of MN is 3cm ——— ½

6 (a) School bus + Student = 10 tons 500 kg

Student's weight = 4 tons 900 kg −02

5 tons 600 kg −01

∴ Mass of the bus is 5 tons 600 kg. −01

(b) $|2x-1| > 3$

Case 1 $+(2x-1) > 3$

$2x-1 > 3$ (0½)

$2x > 4$

$x > 4/2$ (0½)

$x > 2$

Case 2 $-(2x-1) > 3$ (0½)

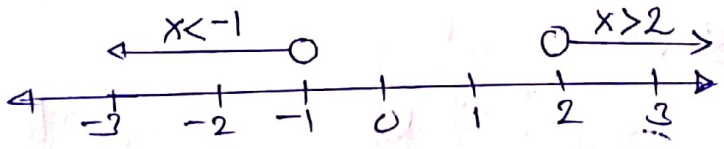
$-2x+1 > 3$

$-2x > 3-1$

$\frac{-2x}{-2} > \frac{2}{-2}$ (0½)

$x < -1$

∴ $x > 2$ and $x < -1$.



(01)

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8 @ $Area_1 = \pi r^2$ ——— ½

$= 22/7 \times 7cm \times 7cm$ ——— ½

$= 154 cm^2$ ——— ½

$Area_2 = \pi r^2$ ——— ½

$= 22/7 \times 28cm \times 28cm$ ——— ½

$= 2464 cm^2$ ——— ½

(b) $1/f = \frac{1}{v} + \frac{1}{u}$ ——— ½

$\frac{1}{f} - \frac{1}{u} = 1/v$ ——— ½

$\frac{u-f}{fu} = \frac{1}{v}$ ——— ½

$v(u-f) = \frac{fu}{u-f}$ ——— ½

$\frac{v(u-f)}{u-f}$

$v = \frac{fu}{u-f}$ ——— 1

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7 @ Given, Mensa 800,000

> Selina 1,200,000

> Moses 850,000

To Express in simplest ratio.

For i, Mensa, since the total 800,000+1200000+850,000

Total = 2,850,000

Mensa = $\frac{800,000}{2,850,000}$

> Mensa = $\frac{80}{285} = \frac{16}{57}$

> Selina = $\frac{1,200,000}{2,850,000}$ $\frac{120}{285} = \frac{8}{19}$

> Moses = $\frac{850,000}{2,850,000} = \frac{85}{285} = \frac{17}{57}$

Then the ratio $\frac{16}{57} : \frac{8}{19} : \frac{17}{57}$.

Hence, Mensa 16:57

> Selina 8:19

> Moses 17:57

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7 b) Given 20,000 for 10 books

The @ book bought for 2000/=

$\frac{2}{5} \times 10 = 4 \times 3000 = 12,000$ ½

The Remained $6 \times 3500 = 21000$ ½

The total amount $12,000 + 21,000$

Then total = 33,000/=.

Profit = Selling price − buying price.

= 33,000 − 20,000

= 13,000.

% Profit = $\frac{\text{Profit made}}{\text{Buying price}} \times 100\%$ ½

Profit made = $\frac{13,000}{20,000} \times 100$

$= \frac{13}{20} \times 100$

$= 13 \times 5$

$= 65$ ½

Then The profit made = 65 ½

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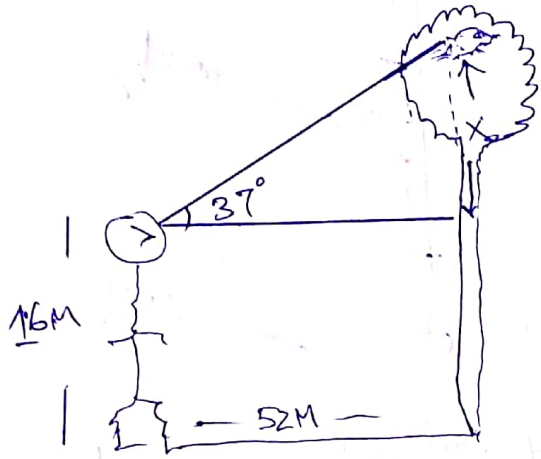
9 b) Sketch.



- 0½

Let the height from the view point to a bird be x

Then, from pythagorous formula by Trigonometric ratio

$$\tan 37° = \frac{X}{52M} \qquad 0½$$

So, $X = 52M \cdot \tan 37°$

$X = 39.18M$ 0½

But, a height of a tree will be $= X + 1.6M$

So, Height $(H) = 39.18M + 1.6M$ 0½

$\therefore H = 40.78M.$

$\therefore$ The height of the Tree from its root is 40.78M 01

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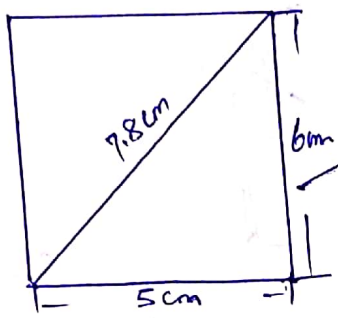
9 @ Required to prove pythagorous theorem

$a^2 + b^2 = c^2$



½

Then, from $a^2 + b^2 = c^2$ ½

$(5cm)^2 + (6cm)^2 = c^2$

$25cm^2 + 36cm^2 = c^2$ ½

$\sqrt{61cm^2} = \sqrt{c^2}$

$c = 7.8cm$ ½

Then $a^2 + b^2 = c^2$

$(5cm)^2 + (6cm)^2 = (7.8)^2$ 1

Hence, the photograph will fit the frame.

~~Hence, height = 1.6m.~~

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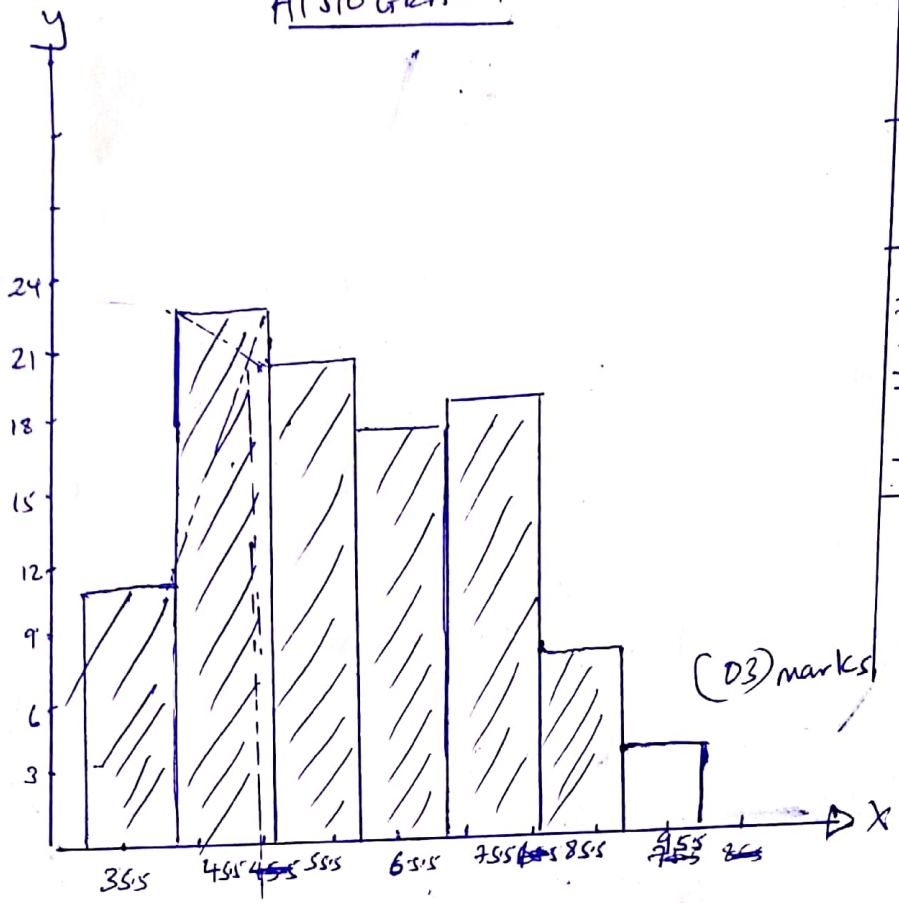
11.

HISTOGRAM



(03) marks

Mode = 48.5 (01) mark

class interval	Class mark (x)	f
31-40	35.5	11
41-50	45.5	23
51-60	55.5	20
61-70	65.5	17
71-80	75.5	18
81-90	85.5	7
91-100	95.5	4
		N=100

(01) mark

class interval Mark	x	f	d = x-A	fd
31-40	35.5	11	-40	-440
41-50	45.5	23	-30	-690
51-60	55.5	20	-20	-400
61-70	65.5	17	-10	-170
71-80	75.5	18	0	0
81-90	85.5	7	10	70
91-100	95.5	N=100	20	Σfd = -1620

(03) marks

Mean ($\bar{x}$) = ~~A + Σf~~

$\bar{x} = A + \frac{\Sigma fd}{N}$ (01) mark

$= 75.5 + \frac{-1620}{100}$

$= 75.5 + -16.3$

$= 59.2$

$\bar{x} = 59.2$ (01) mark

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12 @ $\log x = \bar{8}.0524$. To find value of $\log \sqrt[3]{x}$.

Solution.

$$\log \sqrt[3]{x} = \log (x)^{1/3}.$$

$$= \frac{1}{3} \log x. \quad \text{—— 00½}$$

Since $\log x = \bar{8}.0524$.

$$= \frac{1}{3} \times \bar{8}.0524 \quad \text{—— 00½}$$

$$= \frac{\bar{8}.0524}{3}. \quad \text{—— 01}$$

$$= \frac{\bar{9} + 1.0524}{3}. \quad \text{—— 01}$$

$$= \bar{3} + 0.3508$$

Therefore $\log \sqrt[3]{x} = \underline{\underline{\bar{3}.3508}}$ —— 01.

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12 5) Student to use mathematical tables

$$\frac{(876)^3 \times (0.00537)^{1/2}}{\sqrt[3]{0.0009805}}$$

Number	standard form	Logarithms	
Numerator $(876)^3$	$(8.76\times10^2)^3$	$3\log(8.76\times10^2)$	01
0.00537	5.37×10^{-3}	$-3\times\log 5.37$	01
$\sqrt[3]{0.0009805}$	$(9.805\times10^{-4})^{1/3}$	$\frac{1}{3}\times\log(9.805\times10^{-4})$	02
		Numerator – Den	01
		Ant log (answer)	01.

Then $\dfrac{(876)^3 \times (0.00537)^{1/2}}{\sqrt[3]{0.0009805}} = 4.958\times10^8$ —01

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