ITEM 1

a) i) Scale, 1cm on map represents 250,000cm on Land.

Map		Land
1cm	:	250,000 cm
$1cm^2$	:	$250,000^2 cm^2$

$7.36cm^2 = 250,000^2 \times 7.36 cm^2$.

Now we convert the $250,000^2 \times 7.36cm^2$ on Land using the standard scale.

$1Km = 100,000 cm$

$1Km^2 = 100,000^2 cm^2$

$$250,000^2 \times 7.36 cm^2 = \left(\frac{250,000^2 \times 7.36}{100,000^2}\right) Km^2$$

$$= 46 km^2.$$

∴ The actual area of the swamp is $46 Km^2$.

a) ii) I recommend the use of an excavator, since the actual area of the swamp is $46km^2$ which is greater than $40km^2$.

b) For an excavator, 14 operators are needed each being paid Ugx 125,000 per day for two weeks.

2 weeks $= 2 \times 7$

$= 14$ days.

Amount to be paid $= 14 \times 125,000 \times 14$

$=$ Ugx. 24 500,000.

∴ The operators will be paid Ugx. 24,500,000 for the period of time that they will spend constructing.

c) Total amount given to the Company = 50,000,000/=

Balance after operators expense = Ugx 50,000000

− Ugx 24 500 000

Ugx. 25,500,000.

Construction company share for operation $= 40\%$ of 25,500,000

$= \frac{40}{100} \times 25,500,000$

$=$ Ugx. 10,200,000.

Maintenance and repairs $= 18\%$ of 25,500,000

$= \frac{18}{100} \times 25,500,000$

$=$ Ugx. 4,590,000.

Executive Director $= 25,500,000 - (10,200,000 + 4,590,000)$

$= 25,500,000 - 14\ 790,000$

$=$ Ugx. 10,710,000.

Extra money to the Executive Director $= 10,710,000 - 10,200,000$

$=$ Ugx. 510,000.

∴ The executive Director got the biggest share of Ugx. 10,710,000 than the construction Company's operations share of Ugx. 10,200,000 by Ugx 510,000.

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ITEM 2a)

Men : women $= 5:4$. Total children $= 224$.

women : children $= 3:7$

$\frac{\text{men}}{\text{women}} = \frac{5}{4}$, $\frac{\text{women}}{\text{children}} = \frac{3}{7}$

Using equivalent fractions

$\frac{\text{men}}{\text{women}} = \frac{5}{4} \times \frac{3}{3} = \frac{15}{12}$, $\frac{\text{women}}{\text{children}} = \frac{3}{7} \times \frac{4}{4} = \frac{12}{28}$

$\Rightarrow$ men : women : children $= 15:12:28$.

Let the total number of visitors be x

Total ratio $= 15+12+28$
$= 55$.

$\frac{28}{55}$ of $x = 224$

$28x = 224 \times 55$

$\frac{28x}{28} = \frac{12320}{28}$

$x = 440$.

Total number of visitors $= 440$.

Men $= \frac{15}{55} \times 440$
$= 120$

women $= \frac{12}{55} \times 440$
$= 96$

Total of men and women $= 120 + 96$
$= 216$.

$\therefore$ The total number of men and women who visited the camping site that day were 216.

2b) Adult ticket $=$ Ugx. 30,000.

children ticket $= \frac{1}{2} \times 30{,}000$
$=$ Ugx. 15000.

Total amount collected from adult tickets $= 30{,}000 \times 216$
$=$ Ugx. 6,480,000

Total amount collected from children tickets $= 15000 \times 224$
$=$ Ugx. 3,360,000.

Total amount $= 6{,}480{,}000 + 3{,}360{,}000$
$=$ Ugx. 9840,000.

$\therefore$ The total amount collected by the camping site on that day was 9,840,000.

2c) cost of children ticket in 2024 $=$ Ugx 15000.

Percentage sold for 2025 $= 100 - 20$
$= 80\%$.

cost of the children ticket in 2025 $= \frac{80}{100} \times 15000$
$=$ Ugx. 12000.

Alternatively

In 2024, cost of children ticket $= 15000$.

Amount removed $= \frac{20}{100} \times 15000$
$=$ Ugx. 3000.

Cost of the children ticket in 2025 $= 15000 - 3000$
$=$ Ugx. 12000.

$\therefore$ The cost of the tickets for children in 2025 is Ugx. 12000.

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ITEM 3

3a) Total amount accumulated = ugx 7,080,000.

Total ratio = 7+3 = 10

David's amount = $\frac{7}{10} \times 7{,}080{,}000$

= ugx. 4,956,000

Mark's Amount

= 7,080,000 − 4956000

= ugx. 2,124,000

Amount Mark gives David = 0.4 × 2124,000.

= ugx. ~~1982,400~~ 849,600

∴ Mark will give David shs. ~~1982,400~~ 849,600 of the savings.

3b) i) Initial stock: 252 apples, 210 oranges, 294 pears

we find the GCF of the fruits.

2	252	210	294
3	126	105	147
7	42	35	49
	6	5	7

GCF = 2×3×7

= 42.

∴ David and mark can create 42 boxes from the fruits they have.

3 b ii) Number of apples in each box = $\frac{252}{42}$

= 6 apples

Number of oranges in each box = $\frac{210}{42}$

= 5 ~~apples~~ oranges

Number of pears in each box = $\frac{294}{42}$

= 7 pears.

∴ The ratio of apples : oranges : pears is 6 : 5 : 7 respectively.

3 c) Average monthly profit = ugx 1,800,000.

Rate = 12%   t = 3 years

$= \frac{12}{100}$

$= 0.12$

$A = P(1+r)^t$

$A = 1{,}800{,}000\,(1+0.12)^3$

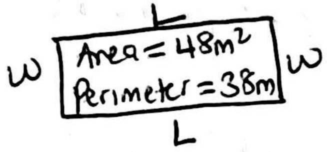
$A = 1{,}800{,}000\,(1.12)^3$

$A = 2{,}528{,}870.4$.

∴ Their expected monthly profit in 3 years will be ugx. 2,528,870.4.

ITEM 4

4a) Let the length of the garden be L and the width be w.



$L \times w = \text{Area}$

$Lw = 48$

$2(L+w) = \text{Perimeter}$

$2(L+w) = 38$

$L+w = 19$

$L = 19 - w$

$$Lw = 48$$
$$w(19-w) = 48$$
$$19w - w^2 = 48$$
$$w^2 - 19w + 48 = 0$$
$$w = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$w = \frac{-(-19) \pm \sqrt{(19)^2 - 4 \times 1 \times 48}}{2 \times 1}$$
$$w = \frac{19 \pm \sqrt{169}}{2}$$
$$w = \frac{19 \pm 13}{2}$$

either $w = \frac{19+13}{2} = 16m$ OR $w = \frac{19-13}{2} = 3m$.

For $w = 16m$, $L = 19 - 16 = 3m$

For $w = 3m$, $L = 19 - 3 = 16m$.

$\therefore$ The length and width of the garden are 16m and 3m respectively.

4b) Let the space (m^2) occupied by one bag of corn be x and space (m^2) occupied by one bag of soya beans be y.

First planting season, 2 bags of corn, 8 bags of soya beans to cover $80m^2$

Second planting season, 5 bags of corn, 4 bags of soya beans to cover $70m^2$.

$$2x + 8y = 80 \quad \text{--- } ①$$
$$5x + 4y = 70 \quad \text{--- } ②$$

using equation ①, $2x + 8y = 80$.

$$\frac{2x}{2} = \frac{80 - 8y}{2}$$
$$x = 40 - 4y \quad \text{--- } ⊗$$

Substituting ⊗ in ②

$$5x + 4y = 70$$
$$5(40 - 4y) + 4y = 70$$
$$200 - 20y + 4y = 70$$
$$200 - 16y = 70$$
$$\frac{16y}{16} = \frac{130}{16}$$
$$\underline{y = 8.125m^2}$$

$$x = 40 - 4y$$
$$x = 40 - 4(8.125)$$
$$x = 40 - 32.5$$
$$\underline{x = 7.5m^2}$$

$\therefore$ Each bag of corn requires $7.5m^2$ of space and Each bag of soya beans requires $8.125m^2$.

4c) Total space this season $= 6x + 3y$

$$= 6 \times 7.5 + 3 \times 8.125$$
$$= 45 + 24.375$$
$$\underline{= 69.375m^2}$$

$\therefore$ $69.375m^2$ of space will be used for planting in this season.

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ITEM 5

Let the number of maize seed sacks be x.

" " " " G-nut Seed sacks be y.

(a) (i) - At least 3 sacks of maize:

$$x \geq 3$$

- Not more than 8 sacks of G-Nuts:

$$y \leq 8$$

- Less than 12 sacks altogether:

$$x + y < 12$$

- G-Nut sacks more than three-quarters of maize Sacks:

$$y > \tfrac{3}{4}x.$$

The mathematical inequalities are;

$$x \geq 3$$
$$y \leq 8$$
$$x + y < 12$$
$$y > \tfrac{3}{4}x$$
$$x \geq 0$$
$$y \geq 0.$$

(b) Inequality ① - $x \geq 3$.

Boundary line, $x = 3$

Testpoint $= (2,2)$

$x \geq 3$

$2 \geq 3$ FALSE

Inequality ② - $y \leq 8$

Boundary line, $y = 8$

Testpoint

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Inequality 3 — $x+y<12$

Boundary line, $x+y=12$

Intercepts.

x	y	
0	12	(0,12)
12	0	(12,0)

Test point = (5,2)

$x+y<12$

$(5)+(2)<12$

$7<12$ TRUE

Inequality 4 — $y \geq \frac{3}{4}x$

Boundary line, $y=\frac{3}{4}x$.

x	y	
4	3	(4,3)
12	9	(12,9)

Test point = (5,5)

$y > \frac{3}{4}x$.

$(5) > \frac{3}{4}(5)$

$5 > \frac{15}{4}$ TRUE

Objective function = $x+y$.

Point	Objective function, x+y	Total
(3,8)	(3)+(8)	11
(3,3)	(3)+(3)	6
(5,6)	(5)+(6)	11
(4,7)	(4)+(7)	11
(6,5)	(6)+(5)	11

Item No.

UGANDA NATIONAL EXAMINATIONS BOARD

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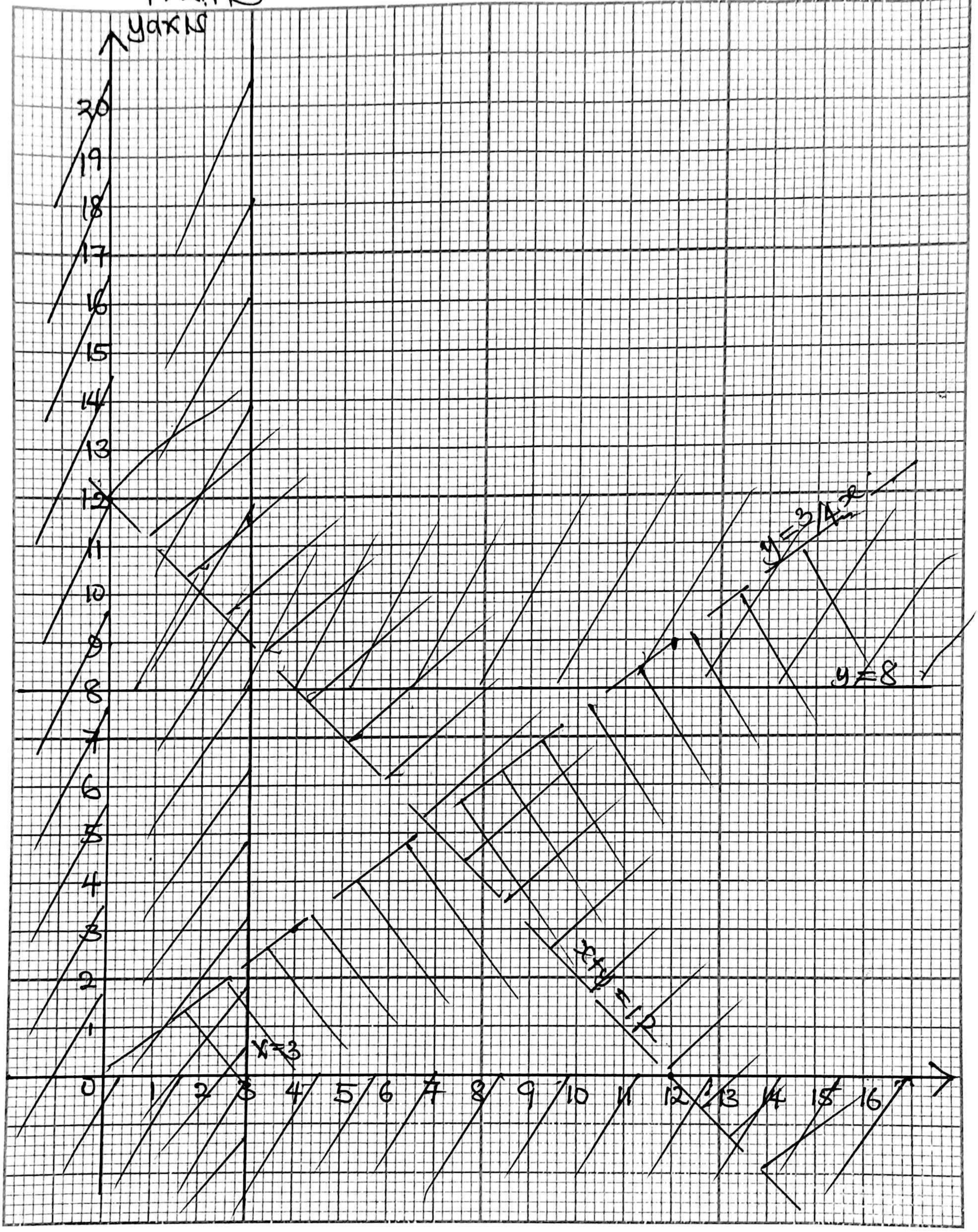

ITEM 6

a) From Maya's Past Packaging:

- 48 books used 2m tape

  Tape per Book $= \frac{2}{48} = 0.0417$ m/Book

- 168 books used 7m tape

  Tape per Book $= \frac{7}{168} = 0.0417$ m/Book

So, the relationship is;

Packing Tape Used $= 0.0417 \times$ Number of Books.

b) Amount of Packing tape used $= 0.0417 \times$ Number of Books.

$= 0.0417 \times 200$

$= 8.34$m.

The total tape needed to package 200 books is 8.34m.

(c) The number of Cardboard boxes be x and number of Paper wraps be y.

- Books in Cardboard boxes more than Paper wraps;

  $x > y$

- Cardboard boxes not more than 100;

  $x \leq 100$

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- Paper wraps at least 60;

$$y \geq 60$$

- Total books not more than 200;

$$x + y \leq 200$$

The mathematical inequalities are;

$$x > y$$

$$x \leq 100$$

$$y \geq 60$$

$$x + y \leq 200$$

For Inequality ① - $x > y$.

Boundary line, $x = y$

Test point = (20, 40)

$20 > 40$ FALSE

For Inequality ② - $x \leq 100$

Boundary line, $x = 100$

Test point = (80, 20)

$80 \leq 100$ TRUE

For Inequality ③ - $y \geq 60$.

Boundary line, $y = 60$

Test point = (80, 40)

$40 \geq 60$ FALSE

For Inequality ④ - $x + y \leq 200$

Boundary line, $x + y = 200$

Intercepts:

x	y
0	200
2000	0

(d) Objective Function = $x + y$.

Point	Objective Function = $x+y$.	Total.
(100, 60)	(100) + (60)	160
(100, 80)	(100) + (80)	180
(58, 62)	(58) + (62)	120
(72, 72)	(72) + (72)	144

The maximum ~~number~~ of card board boxes are 100 and paper wraps are 80, they can use.

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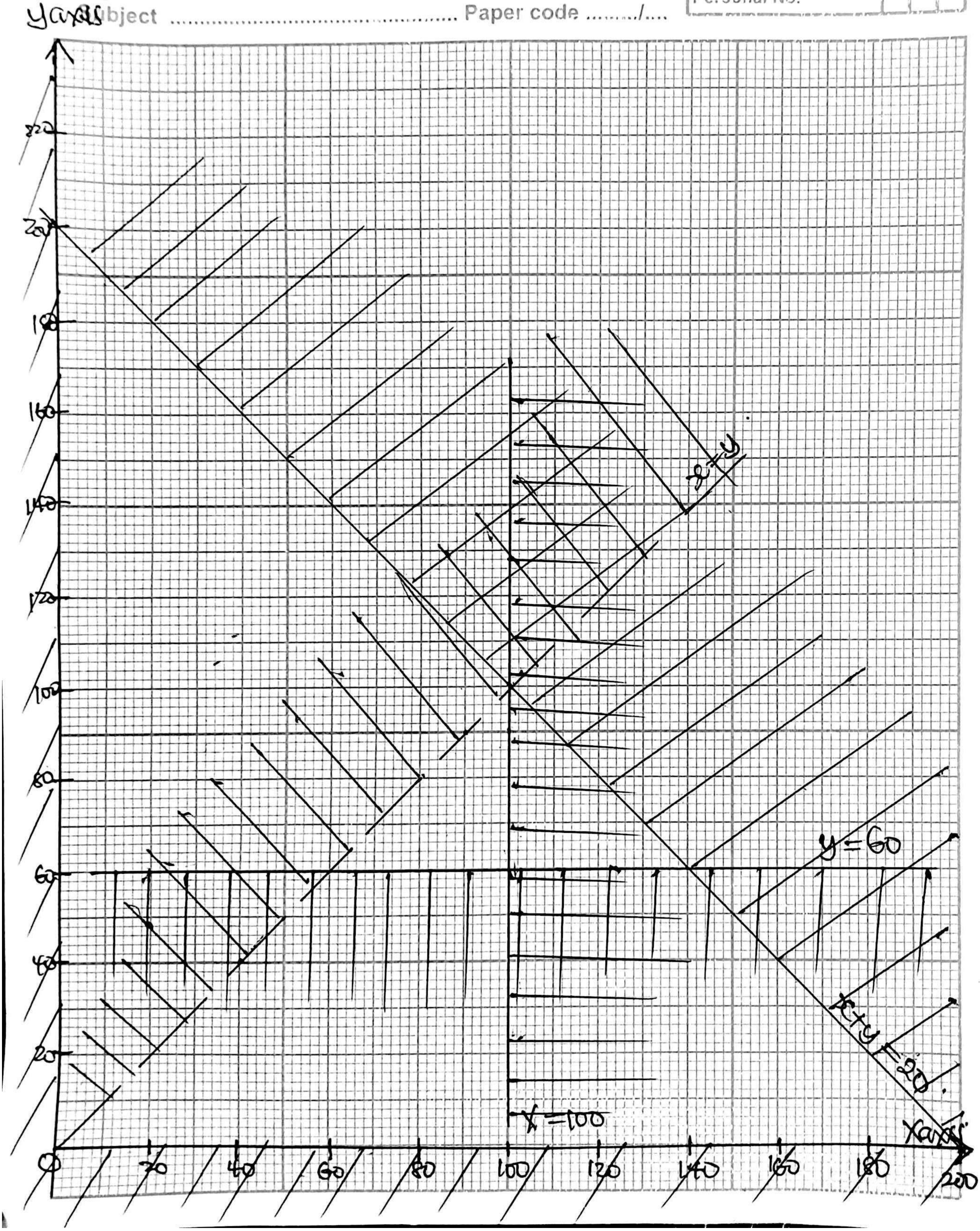


ITEM 7

7a i) Supplies.

	posters	markers	stickers	Banner
Liam	6	5	3	1
Emma	7	4	2	0
Noah	4	4	0	1

	cost
Posters	6500
markers	1000
Stickers	500
Banner	3500

A matrix showing the supplies purchased by students

$$\begin{pmatrix} 6 & 5 & 3 & 1 \\ 7 & 4 & 2 & 0 \\ 4 & 4 & 0 & 1 \end{pmatrix} 3 \times 4.$$

A matrix showing the costs of the supplies purchased

$$\begin{pmatrix} 6500 \\ 1000 \\ 500 \\ 3500 \end{pmatrix} 4 \times 1$$

a) ii)

$$\begin{array}{cccc} P & M & S & B \end{array}$$
$$\begin{pmatrix} 6 & 5 & 3 & 1 \\ 7 & 4 & 2 & 0 \\ 4 & 4 & 0 & 1 \end{pmatrix} \begin{array}{c} P \\ M \\ S \\ B \end{array} \begin{pmatrix} 6500 \\ 1000 \\ 500 \\ 3500 \end{pmatrix}$$

$$= \begin{pmatrix} 6 \times 6500 + 5 \times 1000 + 3 \times 500 + 1 \times 3500 \\ 7 \times 6500 + 4 \times 1000 + 2 \times 500 + 0 \times 3500 \\ 4 \times 6500 + 4 \times 1000 + 0 \times 500 + 1 \times 3500 \end{pmatrix}$$

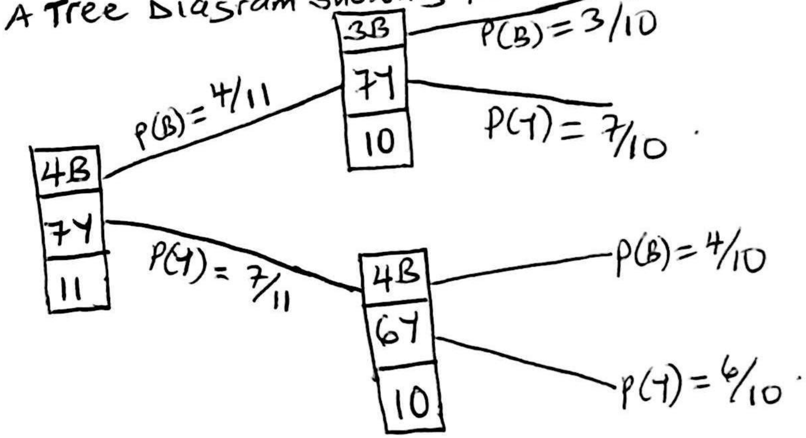
$$= \begin{pmatrix} 49{,}000 \\ 50{,}500 \\ 33{,}500 \end{pmatrix}$$

Total cost $= 49{,}000 + 50{,}500 + 33{,}500$
$= \text{UgX}\cdot 133{,}000.$

∴ The total cost of their items to be used in the club is 133000 ₣.

7b). Let the probability of picking a blue marble and a yellow marble be $P(B)$ and $P(Y)$ respectively.

A Tree Diagram showing picking by Noah.



$$P\binom{\text{Marbles of}}{\text{Different colours}} = P(B \cap Y) + P(Y \cap B).$$

$$= \frac{4}{11} \times \frac{7}{10} + \frac{7}{11} \times \frac{4}{10}$$

$$= \frac{28}{110} + \frac{28}{110}$$

$$= \frac{56}{110} \text{ or } 0.5091 \text{ or } \frac{28}{55}$$

∴ The probability that Noah wins the game and gets to go for shopping is $\frac{56}{110}$ since it represents the probability of picking 2 marbles of Diff colours.

ITEM 8

(a) A Frequency Distrubution Table.

Class Limits	Class Boundary	Mid point (x)	frequency (f)	Tally	fx	Cf
20 – 29	19.5 – 29.5	24.5	4	////	98	4
30 – 39	29.5 – 39.5	34.5	5	~~////~~	172.5	9
40 – 49	39.5 – 49.5	44.5	8	~~////~~ ///	356	17
50 – 59	49.5 – 59.5	54.5	12	~~////~~ ~~////~~ //	654	29
60 – 69	59.5 – 69.5	64.5	10	~~////~~ ~~////~~	645	39
70 – 79	69.5 – 79.5	74.5	6	~~////~~ /	447	45
80 – 89	79.5 – 89.5	84.5	5	~~////~~	422.5	50
			$\Sigma f = 50$		$\Sigma fx = 2795$	

(b) Half of the farmers $= \frac{1}{2}N$.

$= \frac{1}{2} \times 50$

$= 25^{th}$ value.

Number of bags $= 49.5 + 7 \times 1$

$= 56.5$ bags.

Half of the farmers harvested above 57 bags of maize.

C) There 13 Farmers who harvested 44.5 bags or below

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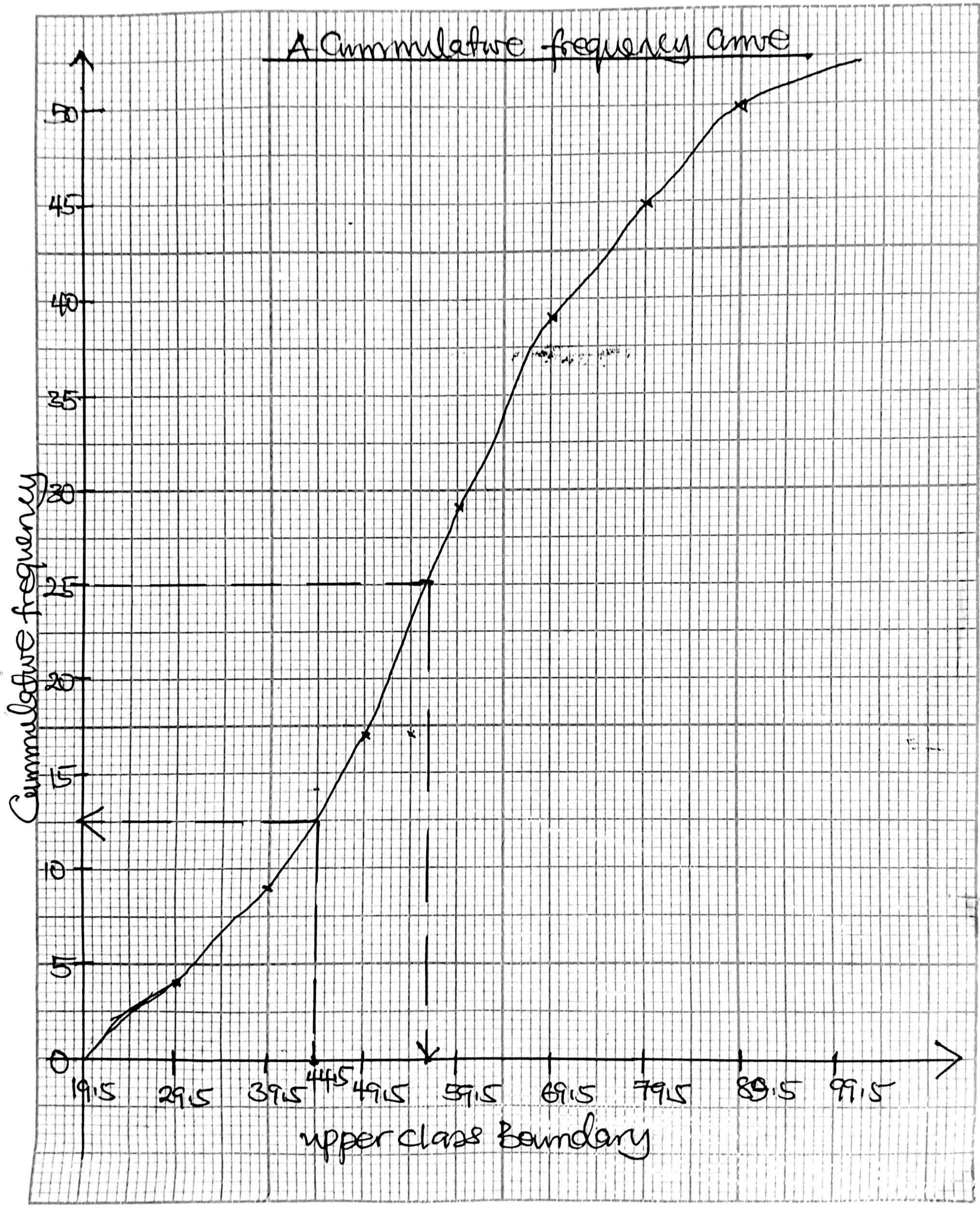
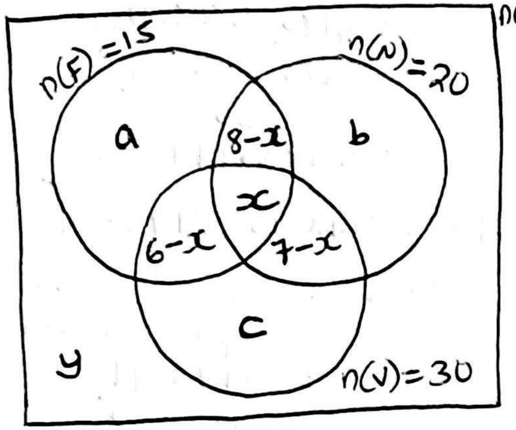


ITEM 9a)

A venn diagram showing students who participated and won in three different games.



$n(F \cup N \cup V) = 48$

For $n(F)$	For $n(N)$	For $n(V)$
$a+8-x+x+6-x=15$	$b+8-x+x+7-x=20$	$c+6-x+x+7-x=30$
$a-x+14=15$	$b-x+15=20$	$c-x+13=30$
$a=1+x$	$b=5+x$	$c=17+x$

$n(F \cup N \cup V) = 48$.

$a+8-x+x+6-x+b+7-x+c = 48$.

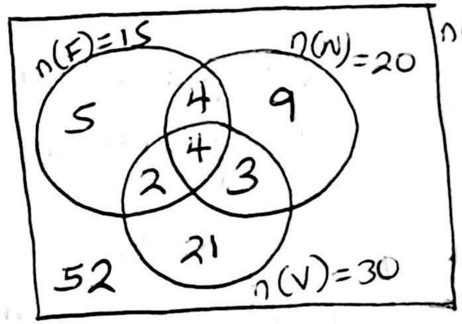
$1+x+8-x+x+6-x+5+x+7-x+17+x = 48$.

$44+x = 48$

$x = 48-44$

$x = 4$

For value of y			
$y+48=100$	$a=1+x$	$b=5+x$	$c=17+x$
$y=100-48$	$a=1+4$	$b=5+4$	$c=17+4$
$y=52$.	$a=5$	$b=9$	$c=21$



∴ 52 students will not receive money from the headteacher since they didnot will any game.

9b) $n(\text{only one game}) = 5+9+21 = 35$ students.

$n(\text{only two games}) = 2+4+3 = 9$ students.

$n(\text{only three games}) = 4$ students.

Amount to be organized by the Head teacher. $= (35 \times 10{,}000) + (9 \times 20{,}000) + (4 \times 30{,}000)$

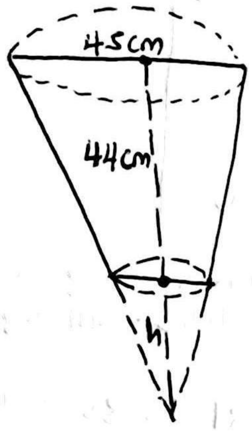
$= 350{,}000 + 180{,}000 + 120{,}000$

$=$ Ugx. 650,000.

∴ The headteacher should organize Ugx. 650,000 for prizing those who fall in the categories he mentioned.

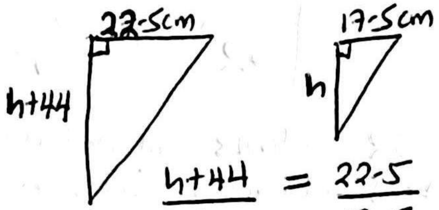
ITEM 10

10a) i)



$R = \frac{45}{2} = 22.5\text{cm}$

$r = \frac{35}{2} = 17.5\text{cm}$.



$$\frac{h+44}{h} = \frac{22.5}{17.5}$$

$$17.5(h+44) = 22.5h$$

$$17.5h + 770 = 22.5h$$

$$5h = 770$$

$$\frac{5h}{5} = \frac{770}{5}$$

$$h = 154\text{cm}.$$

Volume of container = Volume of Larger cone − Volume of small cone

$$= \frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3}\pi \times 22.5^2 \times (154+44) - \frac{1}{3}\pi \times 17.5^2 \times 154$$

$$= 55{,}580.010\ \text{cm}^3$$

$$= \frac{55{,}580.010}{1000}$$

$$= \underline{55.580\ \text{Litres}}.$$

∴ The capacity of the container is 55.580 Litres.

a) ii) Capacity of tank $= \pi r^2 h$

$2.1\text{m} = 2.1 \times 100 = 210\text{cm}$

$1.5\text{m} = 1.5 \times 100 = 150\text{cm}.$

$$= \pi \times \left(\frac{210}{2}\right)^2 \times 150$$

$$= 5{,}195{,}408.851\ \text{cm}^3$$

$$= \frac{5{,}195{,}408.851}{1000}$$

$$= \underline{5{,}195.41\ \text{litres}}$$

∴ The capacity of the tank is 5195.41 litres

a) iii) Number of buckets $= \dfrac{\text{capacity of the tank}}{\text{Capacity of the container}}$

$$= \frac{5195.41}{55.580}$$

$$= 93.476$$

$$\approx 94\ \text{buckets}.$$

∴ 94 buckets must be drawn to fill the tank.

b i) $\frac{A}{B} = \frac{3}{2}$, $\frac{B}{C} = \frac{1}{2}$

Using equivalent fractions

$\frac{A}{B} = \frac{3}{2}$, $\frac{B}{C} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}$

$A:B:C = 3:2:4$.

Total ratio $= 3+2+4 = 9$

For A	For B	For C
$\frac{3}{9} \times 360$ Litres	$\frac{2}{9} \times 360$	$\frac{4}{9} \times 360$
= 120 Litres	= 80L	= 160L

The amount of A, B and C are 120L, 80L, 160L respectively.

b ii) Amount of money needed

$$= (120 \times 1800) + (80 \times 2400) + (160 \times 1275)$$

$$= \text{UGX}.\ 612{,}000.$$

∴ UGX. 612000 is needed to make the mixture.

b iii) % Profit $= \dfrac{\text{Profit}}{\text{cost price}} \times 100\%$

$$= \frac{(2210 \times 360) - 612{,}000}{612000} \times 100$$

$$= 30\%.$$

ITEM 11

11a) $A = P(1 - \frac{r}{100})^t$

$A = 12,500,000(1 - \frac{10}{100})^3$

$A = 12,500,000(0.9)^3$

$A = \text{Ugx } 9,112,500$

∴ Akiso's car will be worth Ugx 9,112,500 by January 2020

11 b) i) 1 swiss franc = 1.28 Deutshe Marks.

x = 54 Deutshe Marks

$x = \frac{54}{1.28}$

x = 42.1875 swiss francs.

∴ The watch is worth 42.1875 swiss francs.

11 b) ii) 1 swiss franc = 1350 Uganda shillings

42.1875 swiss francs = (42.1875 × 1350) Ugshs.

= Ugx. 56953.125.

∴ The watch is worth Ugx. 56953.125

11c) Marriage = 50,000/=
Water and electricity = 60,000/=
Housing allowance = 150,000/=
Medical allowance = 300,000 ÷ 12 = 25,000/=
Transport allowance = 3000 × 30 = 90,000/=
Insurance and relief = 180,000 ÷ 12 = 15,000/=
Children (0 – 10) = 12,000 × 2 = 24,000/=
Children (10–15) = 9,000 × 1 = 9000/=

Total Allowance = 50,000 + 60,000 + 150,000 + 25000 + 90,000 + 15000 + 24000 + 9000
= Ugx. 423000.

Taxable Income = Gross Income – Allowances
= 760,000 – 423000
= Ugx. 337,000.

Income (shs) per month	Rate	Income tax.
1 – 50,000	$\frac{5}{100} \times 50,000$	2500/=
50,001 – 100,000	$\frac{9}{100} \times 50,000$	4500/=
100,001 – 180,000	$\frac{15}{100} \times 80,000$	12,000/=
180,001 – 300,000	$\frac{18}{100} \times 120,000$	21600/=
300,001 – 337,000	$\frac{23}{100} \times 37,000$	8510/=
TOTAL		Ugx. 49,110

Net Income = Gross Income – Income tax
= 760,000 – 49,110
= Ugx 710,890.

∴ Akiso's net income is Ugx 710,890.

11 d) Percentage = $\frac{\text{Income tax}}{\text{Gross Income}} \times 100\%$

$= \frac{49,110}{760,000} \times 100\%$

$= 6.46\%$

∴ 6.46% of Akiso's Gross Income goes to tax.

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ITEM 12

a) Base Area of the cake $= 445.06\,cm^2$.

Height of the cake $= 29.5\,cm$.

Capacity of the cake = Base Area X Height

$= 445.06 \times 29.5$

$= 13{,}129.27\,cm^3$.

$\therefore$ The capacity of the cake is $13{,}129.27\,cm^3$.

b) For capacity of the cake box.

Diameter $= 26\,cm$, $r = \frac{26}{2}$

Height $= 32\,cm$. $r = 13\,cm$.

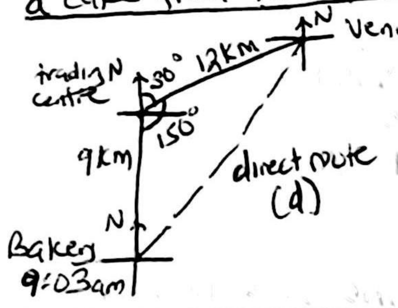
Capacity of the cake box $= \pi r^2 h$

$= \pi \times 13^2 \times 32$

$= 16{,}989.73\,cm^3$.

$\therefore$ The cake will fit in the cake box since its capacity is $13{,}129.27\,cm^3$ which is less than the capacity of the cake box $16{,}989.73\,cm^3$.

c) A sketch showing the transportation route of a cake from the factory to the venue.



Average Speed $= \frac{\text{Total Distance}}{\text{Total time}}$

$\frac{15}{1} = \frac{9+12}{t}$

$15t = 21$

$t = \frac{21}{15}$ hrs

$t = \frac{21}{15} \times 60$ minutes

$t = 84$ minutes.

$t = 1$ hour and 24 minutes.

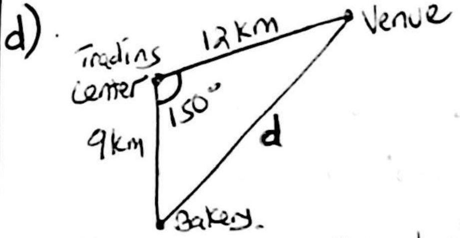
Time of arrival at the venue $=$ 9:03 + 1:24 = 10:27am

Expected arrival = 10:20am

Extra minutes = 10:27 − 10:20 = 00:7

$\therefore$ The service provider will arrive at the venue at 10:27am and thus will not deliver the cake on time since the function will have started already at 10:20am. She will be 7 minutes late.

d)



Using the cosine Rule; $a^2 = b^2 + c^2 - 2bc\cos A$.

$d^2 = 9^2 + 12^2 - 2 \times 9 \times 12 \cos 150°$

$d^2 = 81 + 144 - {}^{-}187.0615$

$\sqrt{d^2} = \sqrt{412.0615}$

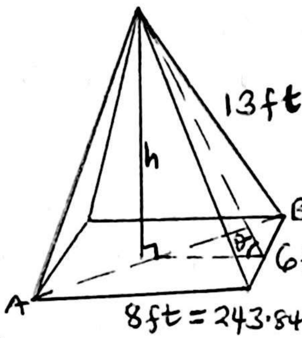
$d = 20.2993\,km$.

$\therefore$ The distance of the direct route from the Venue to the Bakery is $20.2993\,km$.

CamScanner

ITEM 13

13a)



$1ft = 30{\cdot}48cm$

$13ft = 13 \times 30{\cdot}48cm$
$= \underline{396{\cdot}24cm}$

$8ft = 8 \times 30{\cdot}48cm$
$= \underline{243{\cdot}84cm}$

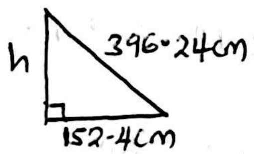
$6ft = 6 \times 30{\cdot}48cm$
$= \underline{182{\cdot}88cm}$

$\overline{AB}^2 = 243{\cdot}84^2 + 182{\cdot}88^2$

$\sqrt{\overline{AB}^2} = \sqrt{92903{\cdot}04}$

$\overline{AB} = 304{\cdot}8cm$.

Half of the Diagonal $\overline{AB} = \frac{304{\cdot}8}{2} = 152{\cdot}4cm$.



$h^2 + 152{\cdot}4^2 = 396{\cdot}24^2$

$h^2 = 396{\cdot}24^2 - 152{\cdot}4^2$

$\sqrt{h^2} = \sqrt{133780{\cdot}3776}$

$h = 365{\cdot}76cm$

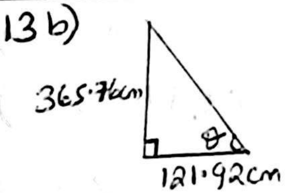
Volume of the pyramid $= \frac{1}{3} \times$ base area $\times$ height

$= \frac{1}{3} \times 243{\cdot}84 \times 182{\cdot}88 \times 365{\cdot}76$

$= 5436834{\cdot}5457cm^3$.

∴ The volume to which the pyramid can hold demonstration items is $5{,}436{,}834{\cdot}5457cm^3$.

13 b)



$\tan\theta = \frac{365{\cdot}76}{121{\cdot}92}$

$\theta = \tan^{-1}\left(\frac{365{\cdot}76}{121{\cdot}92}\right)$

$\theta = 71{\cdot}57°$

∴ The angle between a slanting side and the base of the food pyramid is $71{\cdot}57°$.

13c) For surface area of the pyramid to be painted.

$h_1^2 + 3^2 = 13^2$

$h_1^2 = 169 - 9$

$h_1^2 = 160$

$h_1 = \sqrt{160}$ ft

$h_2^2 + 4^2 = 13^2$

$h_2^2 = 169 - 16$

$h_2 = \sqrt{153}$ ft.

Total Area $= 2\left(\frac{1}{2} \times 6 \times \sqrt{160}\right) + 2\left(\frac{1}{2} \times 8 \times \sqrt{153}\right)$

$= 6\sqrt{160} + 8\sqrt{153}$

Total Area $= 174{\cdot}8492 ft^2$

But $1ft = 30{\cdot}48cm$

$1ft = 0{\cdot}3048m$

$1ft^2 = 0{\cdot}3048^2 m^2$

$174{\cdot}8492 ft^2 = 174{\cdot}8492 \times 0{\cdot}3048^2$

$= \underline{16{\cdot}2440 m^2}$

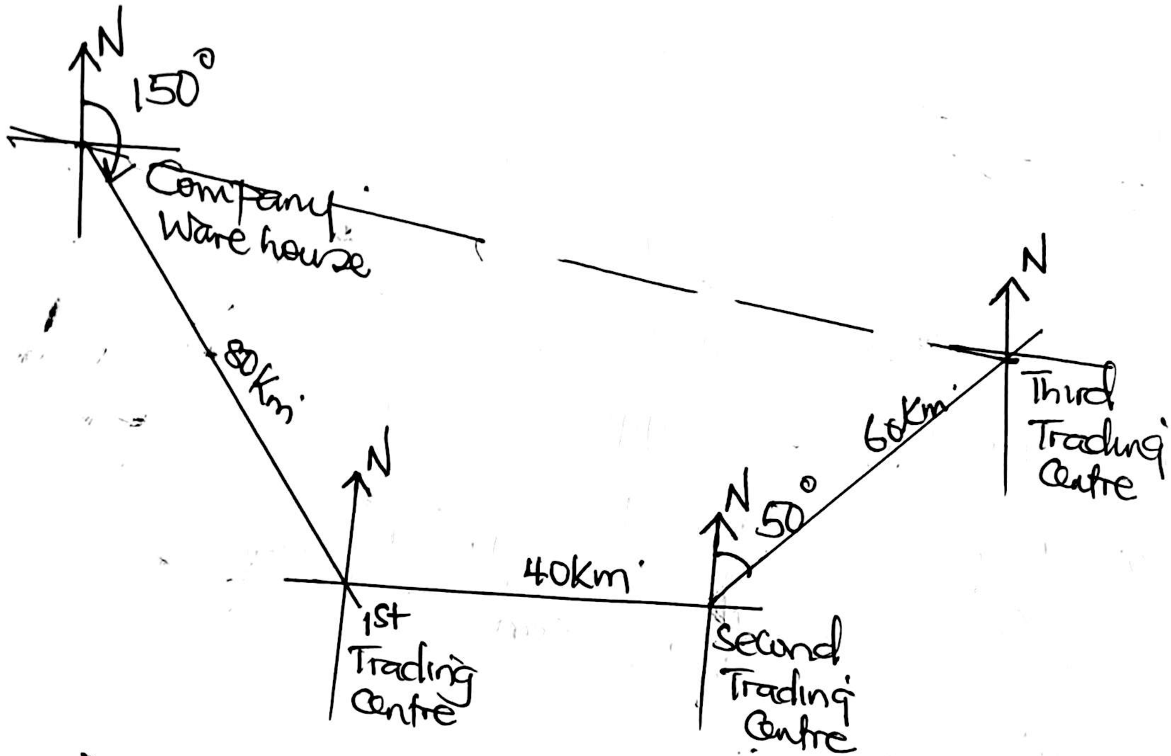
Total cost $= 16{\cdot}2440 \times 4500$

$= 73098{\cdot}10$

∴ The total cost of painting the food pyramid is Ugx. 73098·10

ITEM 14

Sketch.



Distance, $d = 60 \times 2/3 = 40Km$.

Scale.

1cm represents 10 Km.

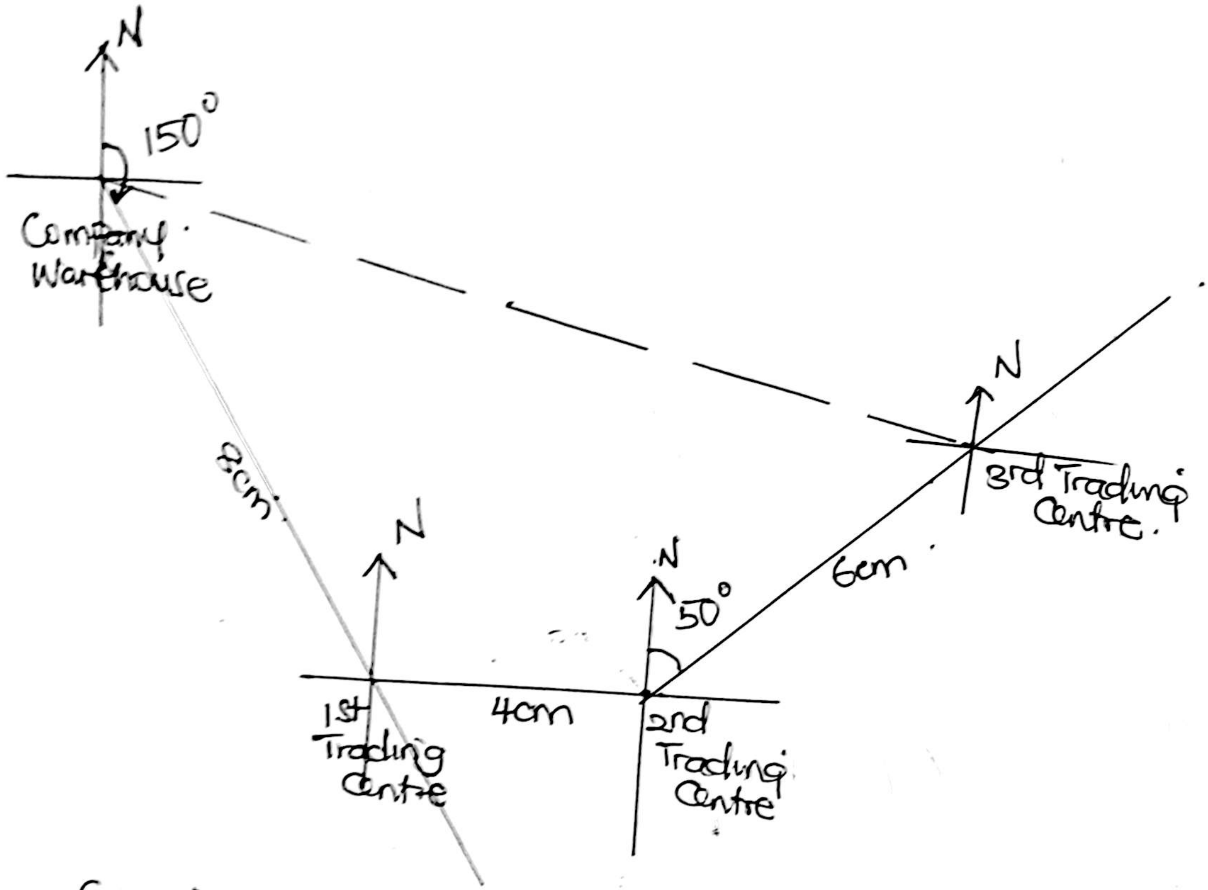
$d_1 = 80Km = \frac{80}{10} = 8cm$.

$d_2 = 40Km = \frac{40}{10} = 4cm$.

$d_3 = 60Km = \frac{60}{10} = 6cm$.

CS CamScanner

Accurate Diagram.



(a) distance = 13cm.

distance = 13X10

= 13Km.

The distance of the direct route from the third Trading Centre to the Company's ware house is 13Km.

(b) It uses 15Km every 1litre of fuel.

Total distance = 80Km + 40Km + 60Km + 130Km.

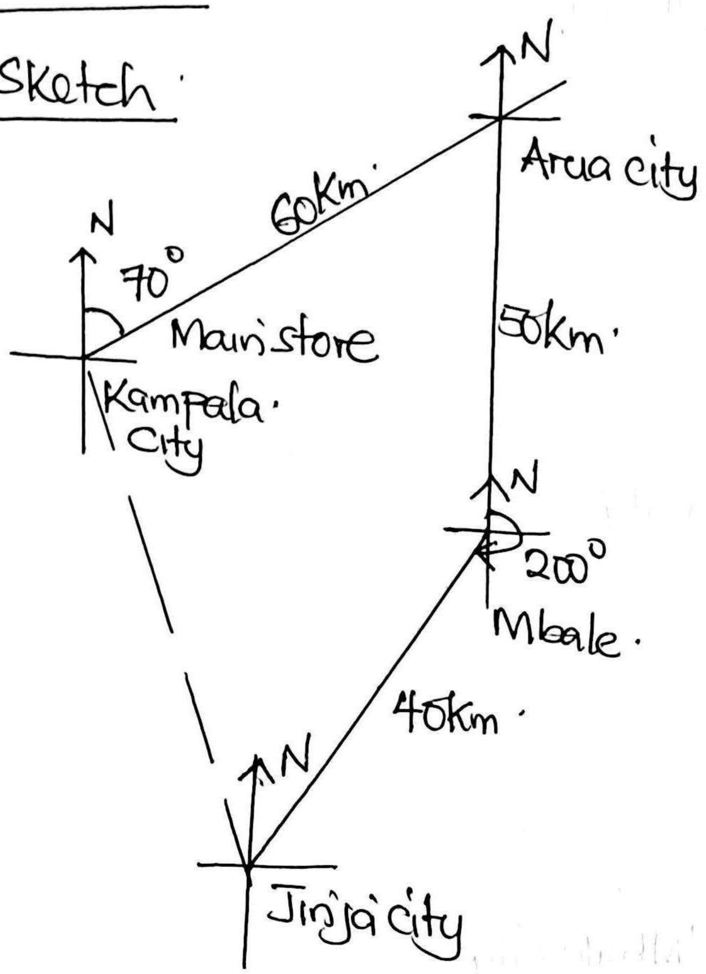
= 310Km.

The car used $= \frac{310}{15} = 20.6\overline{6}$ litres.

He was to add more fuel in Cargo car because the fuel consumption was more than 20litres.

ITEM 16.

Sketch:



Scale

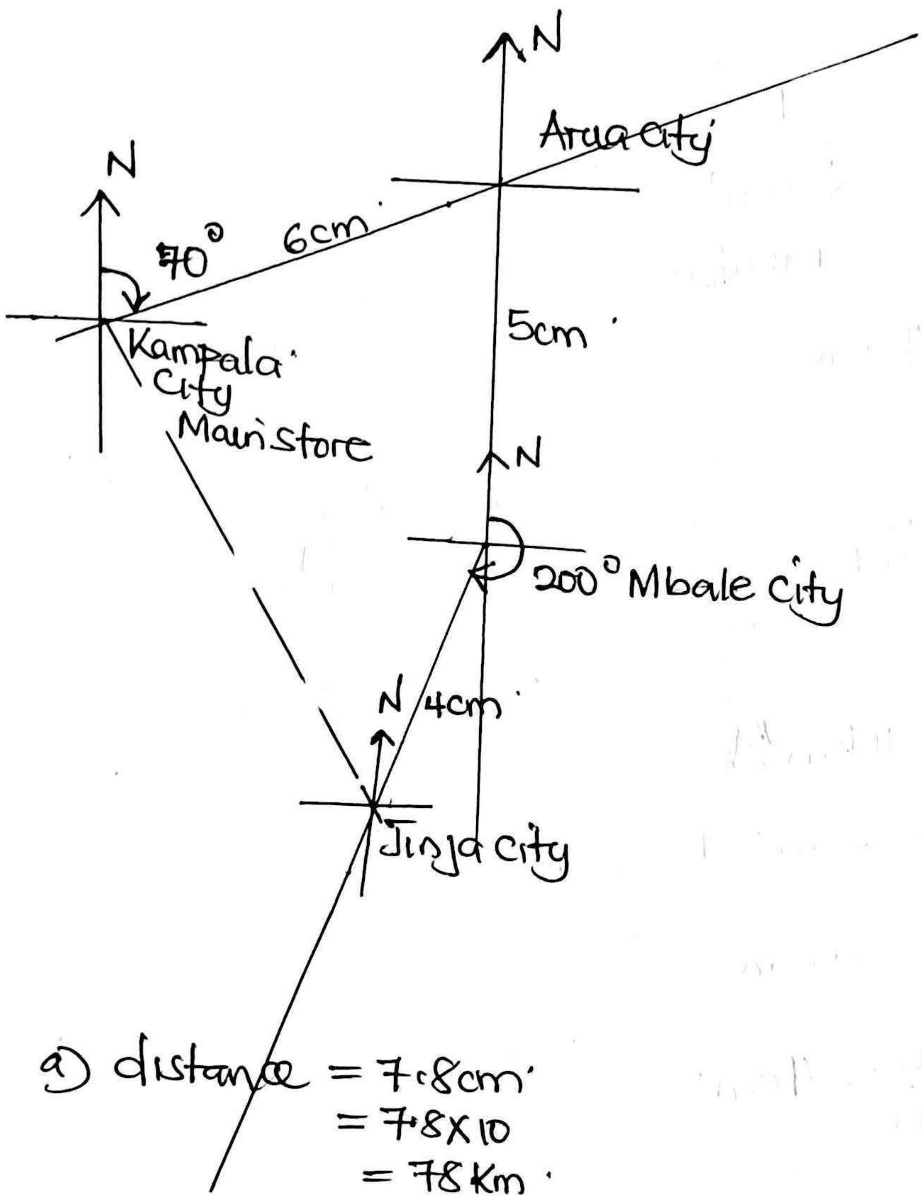
1cm represents 10km.

$d_1 = 60\text{Km} = \frac{60}{10} = 6\text{cm}.$

$d_2 = 50\text{ Km} = \frac{50}{10} = 5\text{cm}.$

$d_3 = 40\text{Km} = \frac{40}{10} = 4\text{cm}.$

Accurate Diagram.



a) distance = 7.8cm.

= 7.8 × 10

= 78 Km.

The distance of the direct route from Jinja city to the main store is 78Km.

b) Total distance = 60km + 50km + 40km + 78Km.

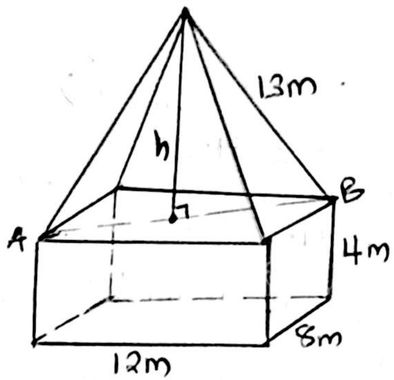
= 228Km.

Total consumption = $\frac{228}{15}$ = 15.2 litres

The remaining fuel was not enough for the Journey because the journey needed more than 15 litres.

ITEM 17.

17a) i)



3 windows (0.9m by 0.6m)

1 Door (2.1m by 0.8m)

1 litre paint → 15000/=

1 litre tin → $5m^2$.

Surface Area of 1 door $= 1 \times 2.1 \times 0.8 = 1.68m^2$

Surface Area of 3 windows $= 3 \times 0.9 \times 0.6 = 1.62m^2$.

Surface Area of outer walls $= 2(L \times h) + 2(w \times h)$

$= 2(12 \times 4) + 2(8 \times 4)$

$= 96 + 64$

$= 160m^2$.

Area to be paited = surface Area of outer walls − (surface Area of door + windows)

$= 160 - (1.68 + 1.62)$

$= 156.7m^2$.

∴ The surface Area of wall to be painted is $156.7m^2$.

a) ii) Number of tins of paint $= \frac{\text{Surface Area to paint}}{\text{Area that a tin can paint}}$

$= \frac{156.7}{5}$

$= 31.34$

≈ 32 tins.

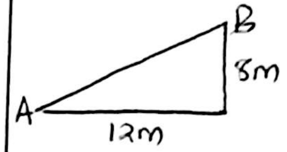
∴ 32 tins of paint will be required to paint the house.

b) Amount to be spent on buying tins $= 32 \times 15000$

$=$ UGX. 480,000.

∴ He will spend UGX. 480,000 on painting the whole house.

c) Height of the whole house = height of cuboid + height of pyramid roof.

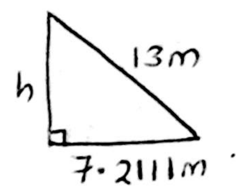


$\overline{AB}^2 = 12^2 + 8^2$

$\overline{AB}^2 = 144 + 64$

$\sqrt{\overline{AB}^2} = \sqrt{208}$

$\overline{AB} = 14.4222m$.



$h^2 + 7.2111^2 = 13^2$

$h^2 = 13^2 - 7.2111^2$

$h^2 = 117.00003679$

$h = 10.8167m$.

height of the house $= 10.8167 + 4$

$= 14.8167m$.

∴ The height of the whole house is 14.8167m.

Volume of the house = Volume of the cuboid + Volume of pyramid

$= (12 \times 8 \times 4) + (\frac{1}{3} \times 12 \times 8 \times 10.8167)$

$= 384 + 346.1344$

$= 730.1344m^3$.

∴ The Volume of the house is $730.1344m^3$.

CS CamScanner