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UGANDA NATIONAL EXAMINATIONS BOARD
UGANDA CERTIFICATE OF EDUCATION
OCTOBER - NOVEMBER, 2023

Candidate's Name ..... EXPECTED RESPONSES .....

Signature .....

Subject ..... Paper code ...../.....

Random No.

Personal Number

Item 1

a) $\begin{pmatrix}1\\2\end{pmatrix}$ km + $\begin{pmatrix}4\\3\end{pmatrix}$ km = $\begin{pmatrix}5\\5\end{pmatrix}$ km

At (5, 5) km from home to Usafi market

OR $\sqrt{50}$ km or $5\sqrt{2}$ km.

b) (i) Total number of tomatoes bought.

1st $242_{five} = (2 \times 5^2) + (4 \times 5) + (2 \times 5^0)$

$= 72$ tomatoes

2nd $664_{eight} = (6 \times 8^2) + (6 \times 8) + (4 \times 8^0)$

$= 436$ tomatoes

Total = (72 + 436) tomatoes

= 508 tomatoes

Tomatoes that were sold = 508 − 10

= 498

Number of packs sold = $\frac{498}{3}$

= 166 packs.

Total sales for a day = 166 × UGX 2000

= UGX 332,000/=

Total expenses on tomatoes.

1st $(2 \times 25000) + (4 \times 2300) + (2 \times 500) + (6 \times 27000)$

$+ (6 \times 3500) + 4 \times 450$

$= (50,000) + 9200 + 1000 + 162000 + 21000 + 1800$

The expenses.

= 25000 + 245,000

= UGX. 270,000/=

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Profit per day = UGX. (332,000 - 270,000) 1 MK
= UGX. (62,000/=). 1 MK

(b) (ii) Number of working days
= (365 x 2) - (4 x 25)
= 682 working days.

Amount needed per day = 10,000,000/=
362
= 27624.30939

Proportion = 27624.30939
62000
= 0.4456.

(b) (ii) Number of working days.
= (365 x 2) - (52 x 2) 1 MK
= 626 days

Amount needed per day 1 MK
= 10,000,000
626
= 15974.44089

Proportion = 15974.44089 1 MK
62000
= 0.25765 1 MK

20 MKS

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MENGO SENIOR SCHOOL

P.O. BOX 1901 KAMPALA -UGANDA

EXAMINATIONS' DEPARTMENT

NAME OF STUDENT:..... DATE:.....

CLASS:..... INDEX NO:..... SIGNATURE:.....

Item 2.

let x and y be classic and modern chairs respectively.

$3x + 2y \leq 120$

$2x + 3y \leq 100$

$x \geq 0, \quad y \geq 0$

Inequality	Boundary line	Co-ordinates
$3x+2y \leq 120$	$3x+2y=120$	$(0,60)$, $(40,0)$
$x+3y \leq 100$	$2x+3y=100$	$(50,0)$, $(20,20)$

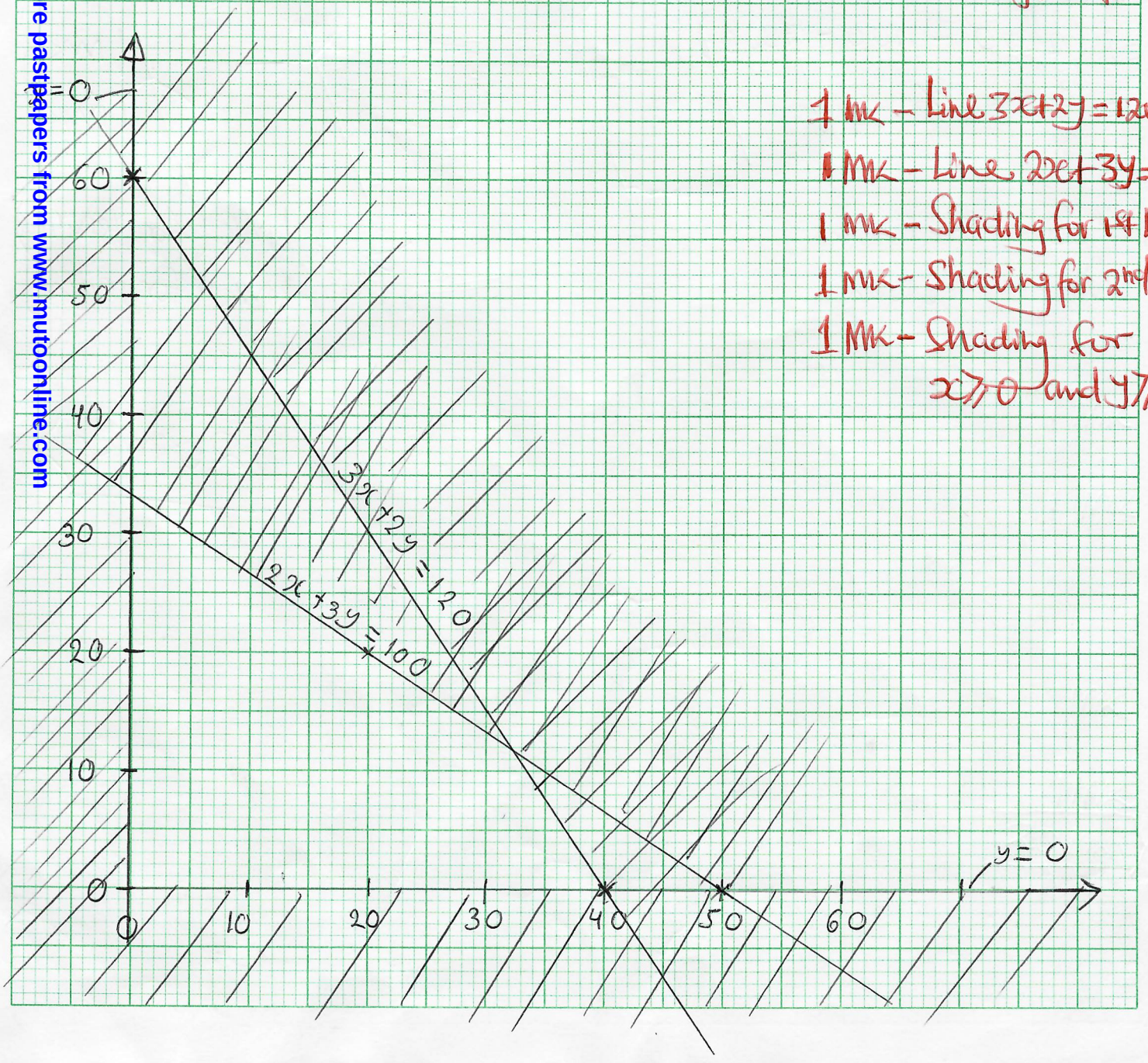
Objective function

$\$50x + \$60y = P(x,y)$.

4 mks (1 for @ inequality)

1 mk } pair of points.
1 mk }

1 mk (objective function)



1 mk - Line $3x+2y=120$

1 mk - Line $2x+3y=100$

1 mk - Shading for 1st Line

1 mk - Shading for 2nd line

1 mk - Shading for $x \geq 0$ and $y \geq 0$

Item 2. (P4)

Co-ordinates	Profit ($50x + 60y$) $
(40, 0)	2000
(32, 12)	23,200
(20, 20)	2200
(5, 30)	2050

1 MK

He must deliver 20 classic chairs and 20 modern chairs to receive a profit of $2200. 1 MK

b) Wood work.

$\frac{1}{2} \times \$2200 = \$1100$ → 1 MK

Furnishings

$(\frac{2}{3} \times \frac{1}{2} \times 2200) = \$733\frac{1}{3}$ → 1 MK

Marketing

$= (2200 - 1100 - 733\frac{1}{3})$ → 1 MK

$\$366\frac{2}{3}$. → 1 MK

c) Yes, ~~re~~ Reason.

No, Reason → { 1 MK (for Yes or No); 1 MK (for reason) }

20 mks

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Item 3

a) Time spent by each on the way.

Drone. 17 05 HRS
08 00 HRS
09 05 HRS

= 9 5/60 HOURS - (2+3) hours

= 4 1/12 Hours.

Costa 17 00 HRS
08 05 HRS
08 55 HRS

= 8 55/60 hours - (1+4) hours

= 3 11/12 hours.

∴ Should always use a costa because it spent less time on the way.

- Use a costa because it ~~left~~ set off late and arrived earlier than the drone thus it spent less time.

b) Amount spent by group A.

= $ ((10,000 x 2) + (20,000 x 3) + (15000 x 4))

= $ [20,000 + 60,000 + 60,000]

= $ 140,000.

Amount spent by group B.

= $ [(10,000 x 1) + (20,000 x 4) + (15000 x 4)].

= $ (10,000 + 80,000 + 60,000).

= $ 150,000.

Difference in amount spent.

$= \$(150,000 - 140,000)$ ✓ 1MK

$= \$\ 10,000$. ✓ 1MK

Group B spent more money by than group A ✓ 1MK

by $\$\ 10,000$. ✓ 1MK.

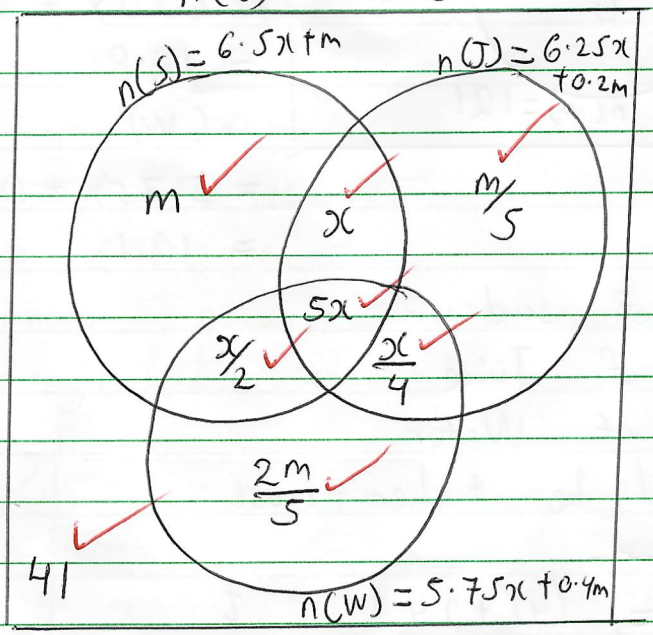
20 MKS

Item 4.

a) let $n(S \cap J)$ only be x

let $n(S)$ only be m

$n(\varepsilon) = 200$



$n(S) = 6{\cdot}5x + m$ 8MKS (1MK @)

$m + 0{\cdot}4m + 0{\cdot}2m = 24$ ✓ 1MK

$\frac{1{\cdot}6m}{1{\cdot}6} = \frac{24}{1{\cdot}6}$ ✓ 1MK.

$m = 15$ ✓ 1MK

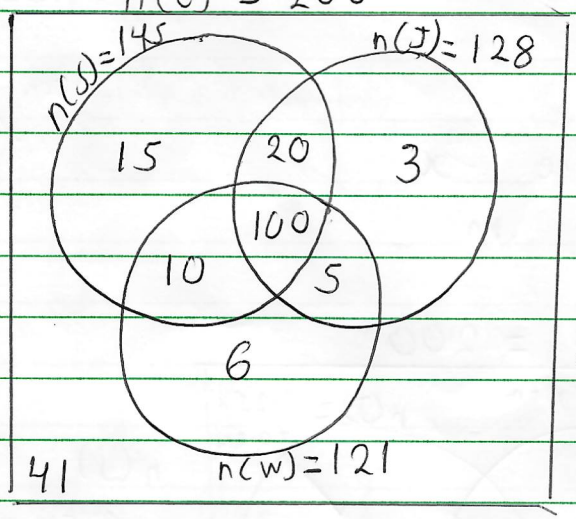
$\Rightarrow 6.5x + 0.25x + 24 + 41 = 200$ ✓ 1MK

$6.75x = 135$

$\frac{6.75x}{6.75} = \frac{135}{6.75}$

$x = 20$ ✓ 1MK

$n(\varepsilon) = 200$



$n(S) = 6.5x + m$
$= (6.5 \times 20) + 15$
$= 145$

$n(J) = 6.25x + 0.2m$
$= 128$

$n(W) = 5.75x + 0.4m$
$= 121$

145 bottles of sodas. ✓ 1MK

128 bottles of Juice ✓ 1MK

121 bottles of Water. ✓ 1MK

b) Sodas would be taken most. ✓ 1MK

Reason: ---- ✓ 1MK

c) Probability $= \frac{(41 + 24)}{200}$ ✓ 1MK

$= \frac{65}{200}$ or $\frac{13}{40}$ or 0.325 ✓ 1MK

20 MKS

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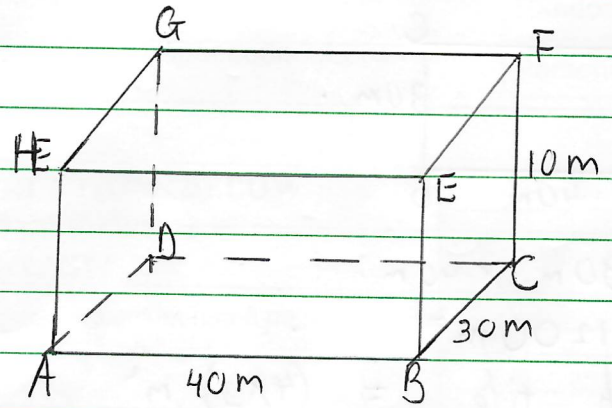
Item 5

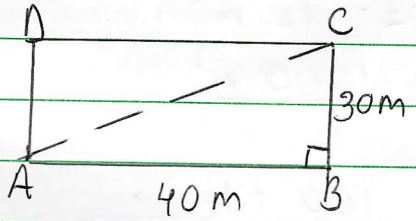
(a) (i)



03

Correct sketch with dimensions seen

(ii)



$\bar{AC} = (\sqrt{40^2 + 30^2})$ m ✓ 1MK

$= \pm 50$ m

$\therefore \bar{AC} = 50$ m ✓ 1MK

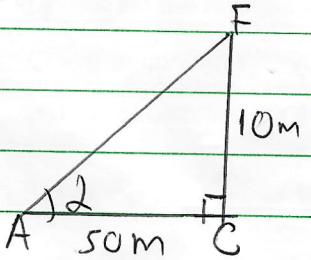
1 m ⟶ 100 cm ✓ 1MK

50 m ⟶ (50×100) cm

$= 5000$ cm ✓ 1MK

∴ The engineer needs 5000 centimetres. ✓ 1MK

(iii) let the angle be 2.



$\tan 2 = \frac{10}{50}$ ✓ 1MK

$2 = \tan^{-1}(\frac{1}{5})$ ✓ 1MK

$2 = 11.31°$ ✓ 1MK

The ladder must placed at an angle of 11.31° ✓ 1MK to the floor.

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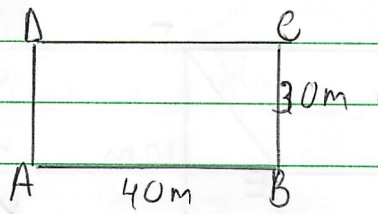
5 b)



Area = 30m x 40m ✓ 1MK

$= 1200\ m^2$. ✓ 1MK

Area of each tile = $(4 \times 3)\ m^2$

$= 12\ m^2$. ✓ 1MK

Number of tiles = $\frac{1200\ m^3}{12\ m^3}$ ✓ 1MK

= 100 tiles. ✓ 1MK

~~Price~~ of Amount to be Spent,

Let the number of tile in a box be n.

Number of boxes = $\left(\frac{100}{n}\right)$ boxes. ✓ 1MK

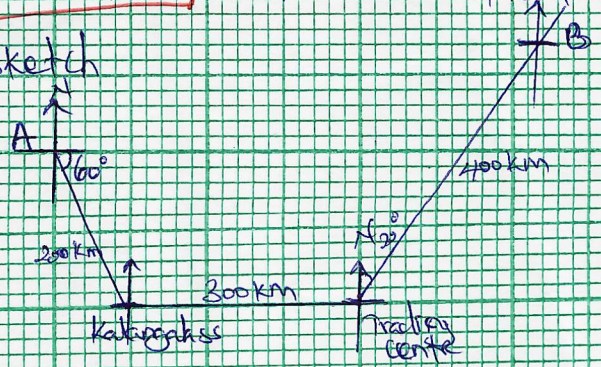
Total amount = UGX $\left(\frac{100}{n} \times 4000\right)$ ✓ 1MK

= UGX. $\left(\frac{400,000}{n}\right)$. ✓ 1MK

20 MKS

ITEM 6 EXPECTED RESPONSES

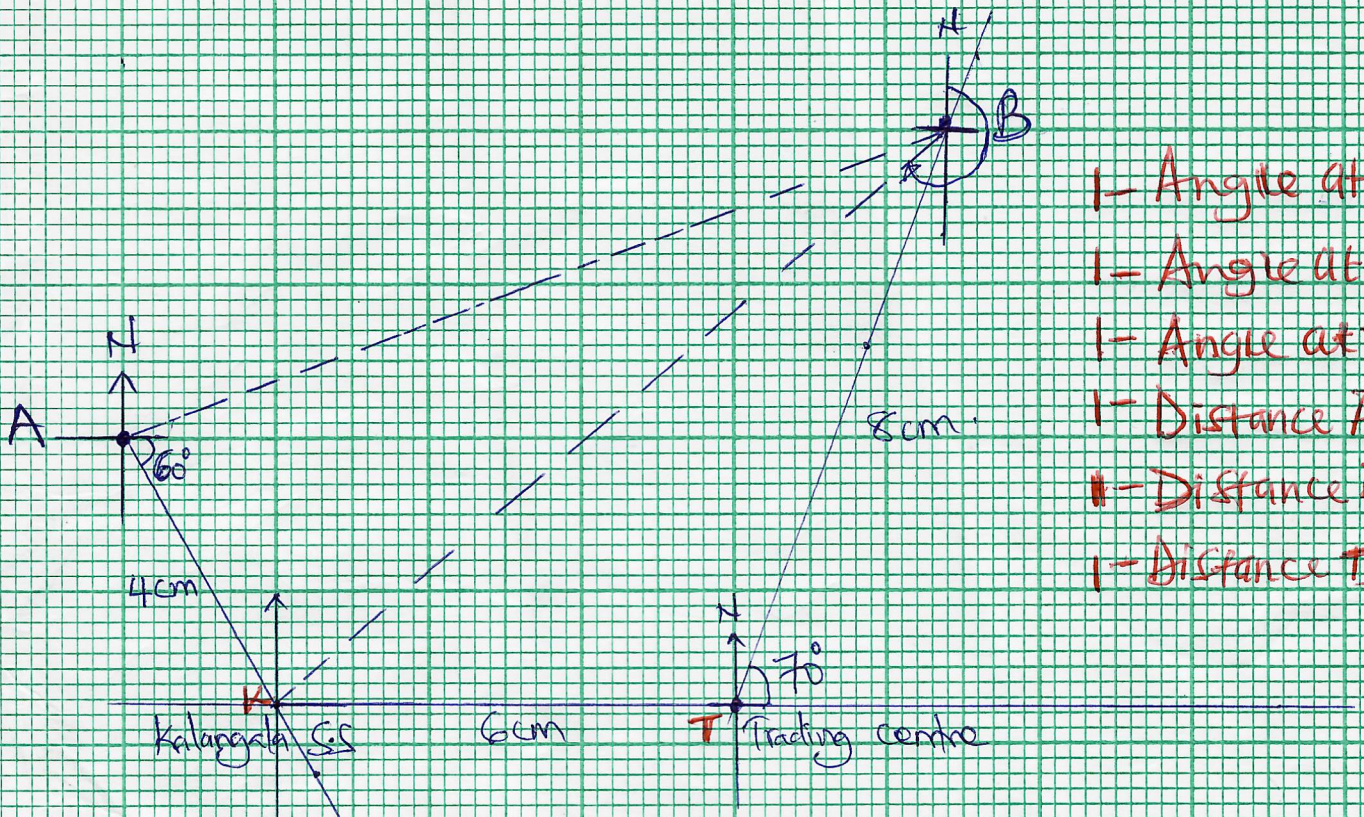
a) Sketch



Scale 1cm = 50km

– 3 MKS

Accurate Drawing.



1– Angle at A
1– Angle at K
1– Angle at T
1– Distance $\overline{AK}$
1– Distance $\overline{KT}$
1– Distance $\overline{TB}$

a) (i) AB = 11.5cm = 11.5 × 50 km = 575 km ✓ 1MK

= 575000 metres. ✓ 1MK

(ii) Distance between the school and Town B is 11.6cm ✓ 1MK

= 11.6 × 50 km

= 580 km. ✓ 1MK

Bearing from B to school is 228° ± 2° ✓ 1MK

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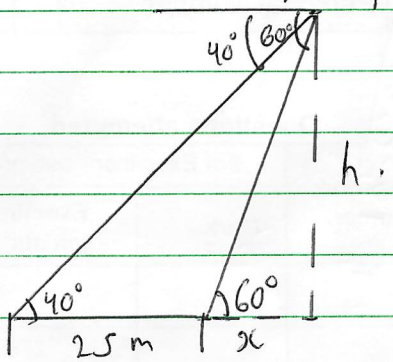
Item 6:

let the vertical distance be h.

c)

Aeroplane.



03 MK (correct sketch)

$\tan 60° = \frac{h}{x}$.

$x \tan 60° = h$ -- (i) 1 MK

$\tan 40° = \frac{h}{(25+x)}$

$25 \tan 40° + x \tan 40° = h$ -- (ii). 1 MK

$\therefore x \tan 60° = 25 \tan 40° + x \tan 40°$.

$x(\tan 60° - \tan 40°) = 25 \tan 40°$.

$x = \frac{25 \tan 40°}{\tan 60° - \tan 40°}$

$x = 23.4923 \text{ m}$. 1 MK

$\therefore h = 23.4923(\text{m}) \tan 60°$

$= 40.6899 \text{ m}$. 1 MK

40.6899 m was the vertical height between the plane and the ground. 1 MK

20 MKS