بسم الله الرحمن الرحيم

SUREKEY EXAMINATIONS BOARD

PRE-PLE EXAMINATION SERIES ONE

2022

MATHEMATICS MARKING GUIDE

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"Don't speak for Quality, Let the Quality Speak for itself"

SECTION A: 40 MARKS

Questions 1 to **20** carry two marks each

1. Work out: 130 x 3

130
x 3
390

3(100 + 30)
300 + 90
= 390

130
130
+ 130
390

	1	3	0	X
0	0/3	0/9	0/0	3

0
3 9 0

130 is 100 + 30 + 0
3x100 + 3x30 + 3x0
300 + 90 + 0
= 390 .

2. Simplify: 4y – 3y + 2y

4y – 3y + 2y
(4y – 3y) + 2y
y + 2y
3y

OR

4y – 3y + 2y BODMAS
(4y + 2y) – 3y
6y – 3y
3y

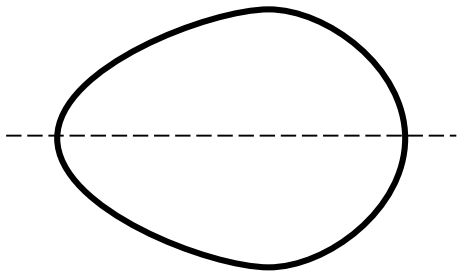
3. Find the product of $\frac{3}{4}$ and $1\frac{1}{2}$.

$\frac{3}{4} \times \frac{3}{2}$

$\frac{3 \times 3}{4 \times 2} = \frac{9}{8}$

$1\frac{1}{8}$

4. How many lines of folding symmetry are in the figure below?



One line of folding symmetry

5. For how long did a motorist take to travel a distance of 210km at a speed of 84km/h without resting from town A to town B?

Time = $\frac{\text{Distance}}{\text{speed}}$

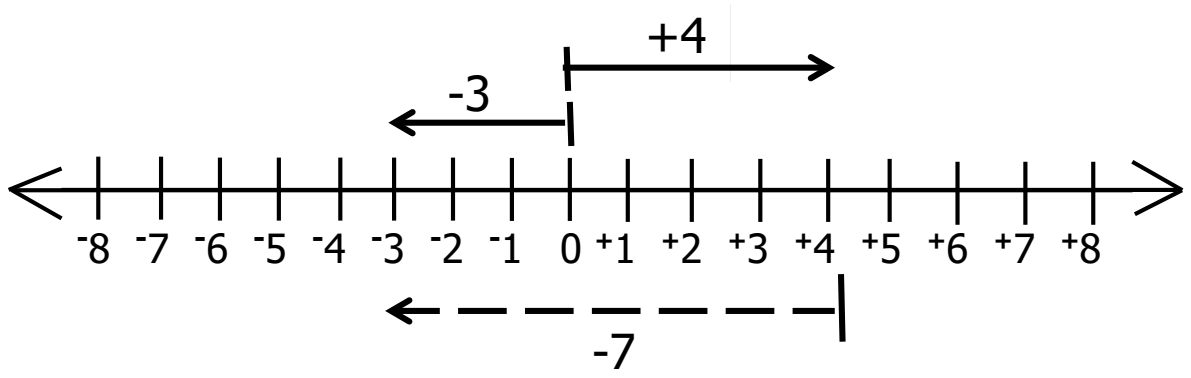
210km ÷ $\frac{84\text{km}}{1\text{hr}}$

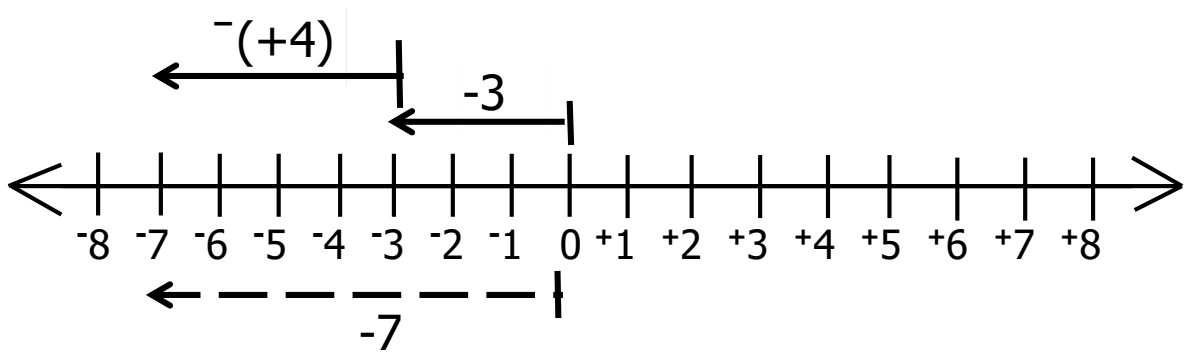
$\frac{210^{5}\text{km}}{} \times \frac{1\text{hr}}{84_{2}\ \text{km}}$

$\frac{5}{2}$ hr

$2\frac{1}{2}$hr

6. Work out $^{-}3 - {}^{+}4$ using the number line below.





7. Change 1000_{two} to decimal base.

2^3	2^2	2^1	2^0
1	0	0	0

(1x2x2x2) + (0x2x2) + (0x2) + (0x1)
8 + 0 + 0 + 0

8_{ten}

ttt	tt	t	o
1	0	0	0

Ones = 0 x 1 = 0
twos = 0 x 2 = 0
two twos = 0 x 2 x 2 = 0
two two twos = 1x2x2 2 = + 8

8_{ten}

8. What number in its least form gives 5 as a remainder when divided by either 8 or 12?

LCM + Remainder

÷	**8**	**12**
2	4	6
2	2	3
2	1	3
3	1	1

(2 x 2) x (2 x 3) + 5
(4 x 6) + 5
24 + 5
29
The number is 29

OR

M8 = {8, 16, (24) 32 ….}
M12 = {12, (24) 36, 48 ..}

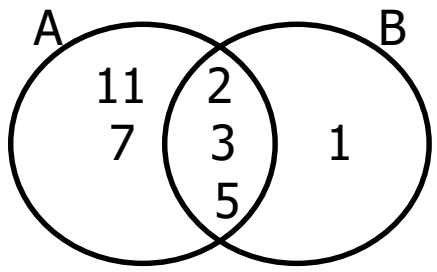
LCM + Rem.
24 + 5
29
The number is 29

OR

5(finite 8) = 5, 13, 21, 29, 36,…..}
5(finite 12) = 5, 17, 29, 41,…..}
= 29

The number is 29

9. Given that AUB = {1, 2, 3, 5, 7, 11}, A∩B = {2, 3, 5} and A – B = {11,7}. Find n(B)



B = {2,3,5,1}
n(B) = 4

OR

n(B) = n(AUB) – n(A-B)
n(B) = 6 – 2
n(B) = 4

OR

AUB = {1, 2, 3, 5, 7, 11}
A – B = {11,7}
B = {2,3,5,1}
n(B) = 4

10. A cuboidal tank 80cm by 70 cm by 120cm is $\frac{2}{3}$ full of water. Find the amount of water needed to fill the tank.

Volume of the tank
Base area X height
(80cm x 70cm) x 120cm
5600cm^2 x 120cm
673000cm^3

Capacity = $\frac{\text{Volume}}{1000\text{cm}^3}$
Capacity = $\frac{672\cancel{000}\cancel{\text{cm}}^3}{1\cancel{000}\ \cancel{\text{cm}}^3}$
= 672 litres

OR

Volume of the tank
Base area X height
(80cm x 70cm) x 120cm
5600cm^2 x 120cm
672000cm^3

Capacity = $\frac{\text{Volume}}{1000\text{cm}^3}$
Capacity = $\frac{672\cancel{000}\cancel{\text{cm}}^3}{1\cancel{000}\ \cancel{\text{cm}}^3}$
= 672 litres

OR

Water in tank

$= \frac{2}{\cancel{3}_1} \times \cancel{672}^{224}$litres
= 2 x 224liitres

= 448litres

Water needed to fill the tank

6 7 2 litres
- 4 4 8 liitres
2 2 4 litres

Fraction needed to fill the tank

$= \frac{3}{3} - \frac{2}{3}$
$= \frac{1}{3}$

Water needed to fill the tank

$= \frac{1}{\cancel{3}_1} \times \cancel{672}^{224}$litres
= 1 x 224liitres

= 244 litres

Height of water in tank

$= \frac{2}{3_1} \times \frac{\cancel{120}^{40}}{} cm$

$= 2 \times 40cm$

$= 80cm$

Height needed to fill tank

$= 120cm - 80cm$

$= 40cm$

Water needed to fill tank

$= \frac{Volume}{1000cm3}$

$= \frac{L \times W \times H}{1000cm3}$

$= \frac{\cancel{80} \times \cancel{70} \times \cancel{40}\ \cancel{cm \times cm \times cm}}{\cancel{1000} \times \cancel{cm \times cm \times cm}}$

$= 8 \times 7 \times 4$

$= 224 \text{ litres}$

11. Change 12:43p.m to 24 hour clock system.

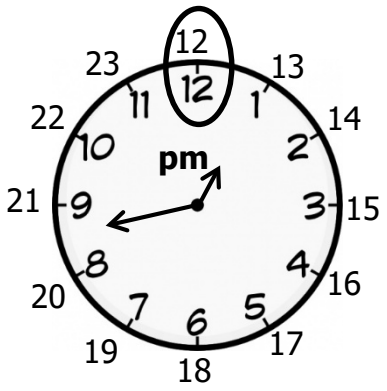
12 43

+ 00 00

12 43 hr

= 1243HR

OR



= 1243HR

12. $51m$ is directly divisible by 3. If the sum of the digits is 15. Find the value of m.

5 + 1 + m = 15

6 + m = 15

6 – 6 + m = 15 – 6

m = 9

13. Tamale borrowed sh.840,000 from Okecho and the two agreed on an interest rate of 7% p.a. After a certain period, Tamale realized that he owed Okecho sh.957,600. For how long did Tamale stay with Okecho's money?

Interest

Amount – Principal

sh.957600

- sh.840000

sh.117600

P x R x T = interest

$sh.840,0\cancel{00} \times \frac{7}{1\cancel{00}} \times T = sh.117600$

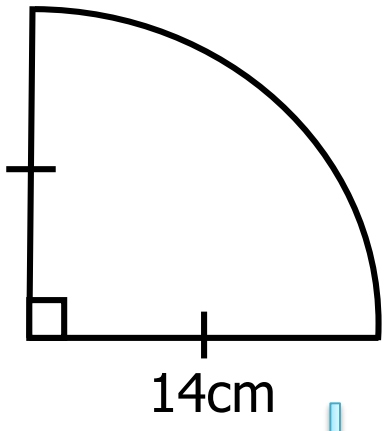
$\cancel{sh.8400 \times 7}\ T = \frac{\cancel{sh.117600}}{\cancel{sh}.8\cancel{400} \times \cancel{7}_1}$ (168)

$T = \frac{\cancel{168}^2}{\cancel{84}_1}$

5

T = 2yrs

14. Calculate the perimeter of the figure below. (Use $\pi = \frac{22}{7}$)



Perimeter = $\frac{1}{4} 2\pi$ r + 2r

= ($\frac{1}{4_{21}}$ x $\frac{\cancel{2}^{1}}{}$ x $\frac{22}{\cancel{7}_{1}}$ x $\frac{\cancel{14}^{2}}{}$cm) + 2 x 14cm

= (11 x 2cm) + 28cm

= 22cm + 28cm

= **50cm**

Diameter = r + r

= 14 + 14cm

= 28cm

OR

Perimeter = $\frac{1}{4}\pi$ D + D

= $\frac{1}{4_{1}}$ x $\frac{22}{\cancel{7}_{1}}$ x $\frac{\cancel{28}^{4^{1}}}{}$cm + 28cm

= 22 + 28cm

= 50cm .

15. Musa made a profit of sh.200 on each of the 19 plates he sold. At how much did he buy the plates if he got sh.38,000 after selling all the plates?

Profit on 19 plates

19 x sh200

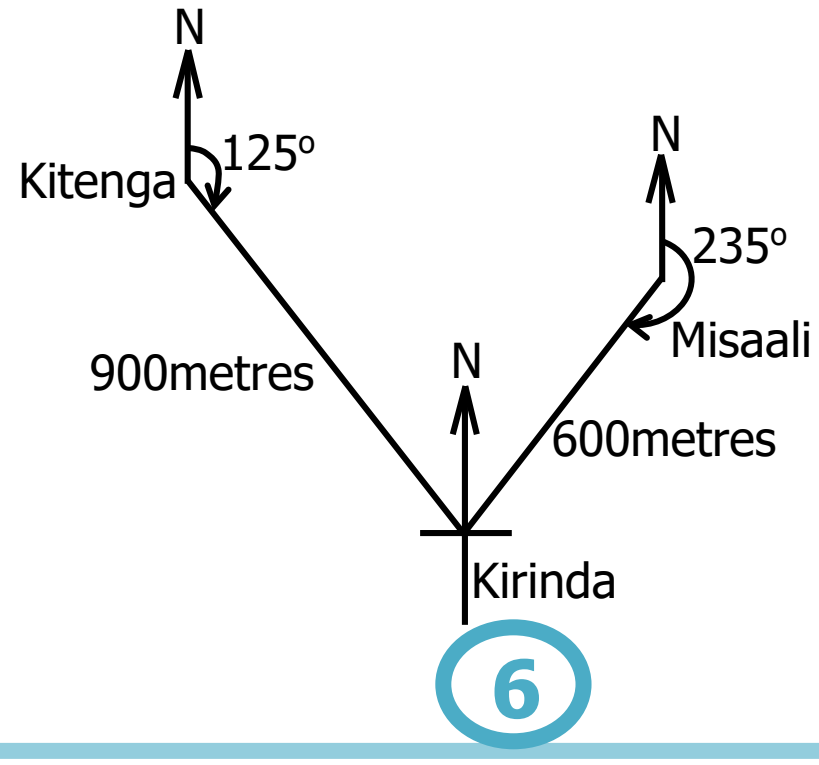
= sh3800

B.P = S.P – P

= sh38,000 – sh3,800

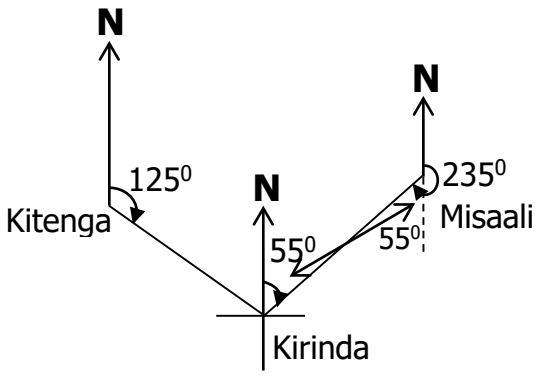
= sh34,200 .

16. The diagram below shows the location of three villages; Kirinda, Misaali and Kitenga.



Find the bearing of Misaali from Kirinda.

METHOD ONE



Misaali from Kirinda

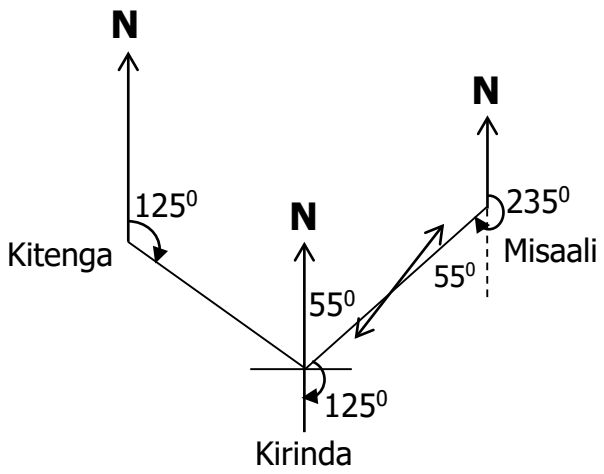
$090^0 + 090^0 = 180^0$

$= 235^0$

-180^0

055^0

METHOD TWO



Misaali from Kirinda

180^0

-125^0

055^0

17. Seven books cost sh.10,500. Find the cost of 5 similar books.

7 books cost sh.10500

1 book costs sh.1500

= sh.1500

5 books cost sh.1500 x 5

= **sh.7500**

18. Ayo had 0.25 of a cake. He gave 0.4 of it to Bunjo. What fraction of the cake did Ayo remain with?

Fraction Ayo had

$\frac{25}{100} \quad \frac{1}{4}$

Fraction Bunjo got

$\frac{4}{10}$ of $\frac{1}{4}$

$\frac{4^1}{10} \times \frac{1}{4_1} = \frac{1}{10}$

Fraction that remained

$1 - \frac{1}{4} \quad \frac{}{10}$ LCD = 20

$\frac{5 - 2}{20}$

$= \frac{3}{20}$

OR: 0.15

19. Calculate the exchange rate in Uganda shillings at which the bank bought 150 US dollars to give Sam Ugsh.577,500.

150 US dollars = Ugsh.577,500

1 US dollar = Ugsh$\frac{\overset{385}{\cancel{577,500}}}{\cancel{150}_{1}}$

= **Ugsh.3,850**

20. A box of mangoes weighs 20.25kg. The empty box weighs 2.25kg. If each mango weighs 30 grams, how many mangoes are in the box?

Weight of mangoes

20.25kg – 2.25kg

= 18kg

Weight to grams

1kg = 1000g

18kg = 1000 x 18

= 18000g

Number of mangoes

$\frac{\cancel{18}^{6}000\cancel{0}g}{\cancel{3}_{1}\cancel{0}g}$

= 600 mangoes

SECTION B: 60 MARKS

Answer **all** questions in this section

Marks for each question are indicated in brackets.

21. (a) Workout: $\frac{2x+1}{3} = \frac{x+8}{2}$ (03 Marks)

$\frac{2x+1}{3} = \frac{x+8}{2}$ LCD = 6

$\frac{\cancel{6}^{2} \times (2x+1)}{\cancel{3}_{1}} = \frac{\cancel{6}^{3} \times (x+8)}{2_{1}}$ **LCD = 6**

2 (2x + 1) = 3(x +8)

4x + 2 = 3x + 24

4x – 3x = 24 – 2

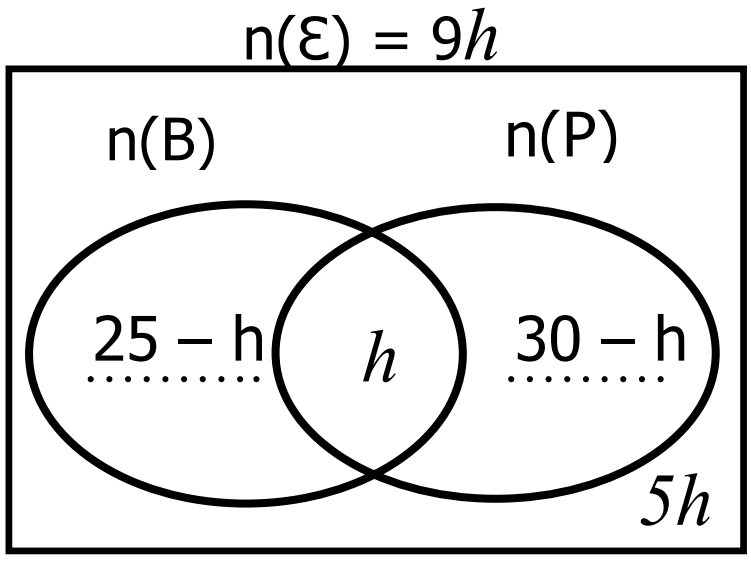
x = 22 .

(b) If 4 minus 3(h – 2) equals 1. Find the value of h. (02 Marks)

$$4 - 3(h - 2) = 1$$
$$4 - 3h + 6 = 1$$
$$4 + 6 - 3h = 1$$
$$10 - 3h = 1$$
$$10 - 10 - 3h = 1 - 10$$
$$-3h = -9$$
$$\frac{-3h}{-3} = \frac{-9}{-3}$$
$$h = 3$$

22. In a school of $9h$ pupils, 25 pupils prefer eating Beans (B), 30 pupils prefer Peas (P), $5h$ pupils like neither of the two sauce while h pupils prefer eating both beans and peas.

(a) Use the above information to complete the Venn diagram below. (02 Marks)



(b) Find the number of pupils who don't like peas. (02 Marks)

$$25 - h + 30 - h + 5h + h = 9h$$
$$25 + 30 - h - h + 5h + h = 9h$$
$$55 - 2h + 6h = 9h$$
$$55 + 4h = 9h$$
$$55 + 4h = 9h - 4h$$
$$\frac{55}{5} = \frac{5h}{5}$$
$$h = 11$$

Pupils who don't like peas

$$= (25 - h) + 5h$$
$$= (25 - 11) + (5 \times 11)$$
$$= 14 + 55$$
$$= \mathbf{69 \text{ pupils}}$$

OR

h = (25 + 30 + 5h) - 9h

h = 55 + 5h - 9h

h = 55 - 4h

h + 4h = 55 – 4h + 4h

$\frac{5h}{5} = \frac{55}{5}$

h = 11

Pupils who don't like peas

= (25 – h) + 5h

= (25 – 11) + (5 x 11)

= 14 + 55

= 69 pupils

23. The table below shows the percentage of cattle on Mukisa's farm.

Cows	Bulls	Calves
55%	x %	30%

If Mukisa remained with 60% heads of cattle after selling 192 cattle, how many less bulls than cows were on the farm?

(05 Marks)

Percentage sold

= 100% - 60%

= 40%

Let the total number of cattle be y

= $\frac{40}{100}$ x y = 192

= $\frac{40y}{100}$ x 100 = 192 x 100

= $\frac{40y}{40}$ = $\frac{192^{48} \times 100}{4_1 0}$

y = 48 x 10

= 480 cattle

Number of bulls

= x% + 55% + 30% = 100%

= x% + 35% = 100%

= x% + 85% -85% = 100% - 85%

$\frac{x\%}{1\%} = \frac{15\%}{1\%}$

x = 15

= $\frac{15^3}{10^{21}0} \times \frac{48^{24}0}{}$

= 3 x 24

= 72 bulls

Number of cows

= $\frac{55}{100}$ x 480

= 11 x 24

= 264 cows

Less bulls than cows

= 264

- 72

192 less bulls

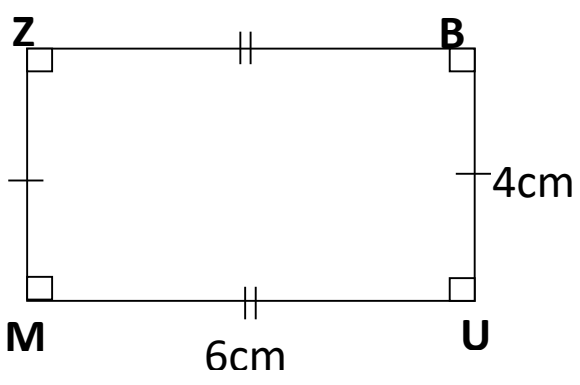
24. A pupil spent $\frac{1}{6}$ of the pocket money on soda and $\frac{1}{4}$ of the remainder on transport and was left with Sh.36,000. How much money did the pupil have at first? (05 Marks)

Soda	Remainder	Transport	Soda + Transport
$\frac{1}{6}$	$\frac{6}{6} - \frac{1}{6}$	$\frac{1}{4}$ of $\frac{5}{6}$	$\frac{1}{6} + \frac{5}{24}$ LCD = 24
	$\frac{5}{6}$	$\frac{1 \times 5}{4 \times 6}$	$\frac{4 + 5}{24} = \frac{\cancel{9}^{3}}{\cancel{24}_{8}}$
		$\frac{5}{24}$	$\frac{3}{8}$

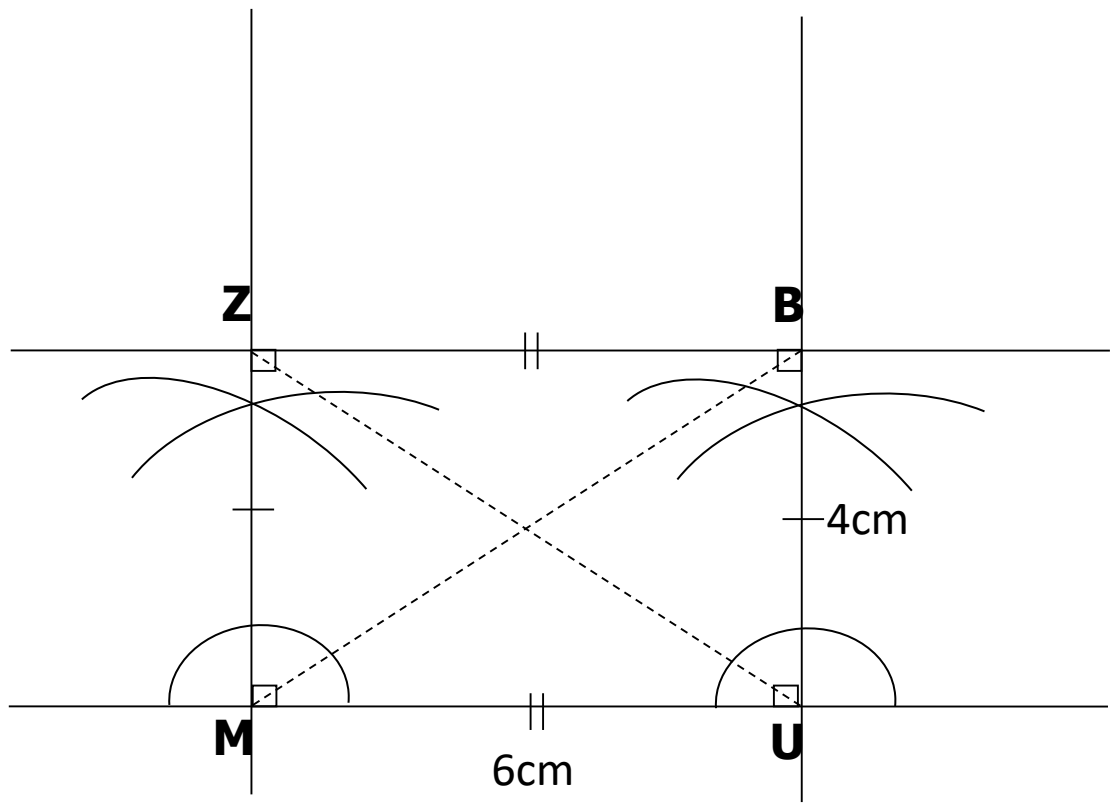
Remaining fraction	Amount of pocket money had at first
$\frac{8}{8} - \frac{3}{8}$	Sh.36,000 ÷ $\frac{5}{8}$
$\frac{5}{8}$	Sh.$\cancel{36,000}^{720} \times \frac{8}{\cancel{5}_{1}}$
This fraction is equivalent to sh36,000	Sh.7,200 x 8
	= Sh. 57,600

25. (a) Using a ruler, a pencil and a pair of compasses only, construct a quadrilateral MUBZ such that MU = 6cm and UB = 4cm. (04 Marks)

Sketch



Actual drawing



(b) Measure;

(i) Diagonal UZ ……**7.1 , 7.2 , 7.3**…… cm. (01 Mark)

(ii) angle BMU = ……**$33^0, 34^0, 35^0$**…… . (01 Mark)

26. (a) Solve: 2n + 4 = 2 (finite 6) (02 Marks)

2n + 4 – 4 = 2 – 4 (finite 6)

2n = 2 – 4 (finite 6)

2n = (2+6) – 4 (finite 6)

2n = 8 – 4 (finite 6)

$\frac{2n}{2} = \frac{4}{2}$ (finite 6)

n = 2 (finite 6)

(b) Workers on a farm are paid every after 28 days. If they received their last pay on a Thursday, on which day will they receive their next pay? (02 Marks)

Days + day

28 + 4 = __ (finite 7)

32 = __ (finite 7)

32 ÷ 7 = 4 rem 4 (finite 7)

= 4 (finite 7)

The workers will receive their next pay on Thursday.

27. After testing for COVID-19 at Mulago Hospital, the ratio of positive to negative to asymptomatic cases was 4:5:7 respectively. If the total number of negative and positive cases was 63,

(a) find the number of negative cases tested at the hospital. (03 Marks)

Positive	Negative	asymptomatic	Total ratio
4	5	7	16

Sum of Neg + Pos ratio

5 + 4 = 9

Total no. of cases

63 ÷ 9
16

$\cancel{63}^{7}$ x $\frac{16}{\cancel{9}_{1}}$

7 x 16

112 cases

Negative cases

$\frac{5}{\cancel{16}_{1}}$ x $\cancel{112}^{7}$

5 x 7

35 cases

(b) How many more asymptomatic than positive cases were tested at the hospital? (02 Marks)

Diff in ratios

7 – 4 = 3

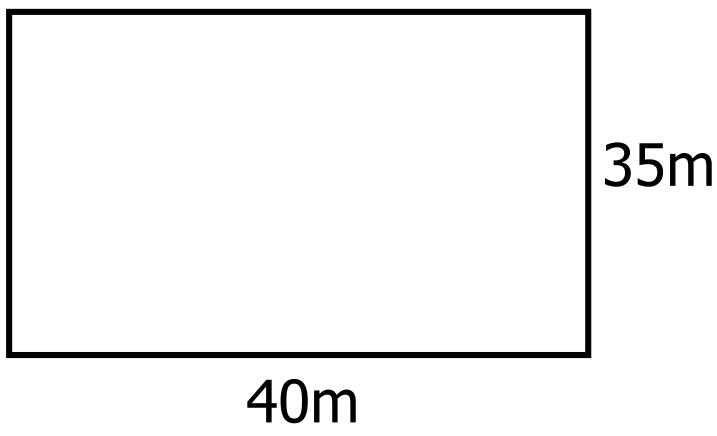
More asymptomatic than positive cases

$\frac{3}{16_1} \times \frac{112^{7}}{1}$

3 x 7

21 cases

28. Mr.Surekey used poles of diameter 0.5m each placed at intervals of 4.5m to fence his flower garden shown in the figure below.



(a) How many poles did Mr.Surekey use to fence the flower garden? (03 Marks)

Perimeter of the flower garden

2 (L + W)

2 (40m + 35m)

2 x 75m

= 150m

Distance covered by the pole = 0.5m
Distance between poles = + 4.5m
Total distance between poles 5.0m

Number of poles needed

Perimeter / Interval

$\frac{150^{30}\ m}{5_1\ m}$

= 30poles .

(b) If each pole costs sh.12,000 and Mr.Surekey was given a 10% discount on the total cost of all the poles, how much did he pay for the poles? (02 Marks)

Total cost of the 30 poles

1 pole costs Sh.12,000

30 poles cost Sh.12,000 x 30

=Sh.360,000

Discount

$\frac{10}{100} \times$ Sh.360,000

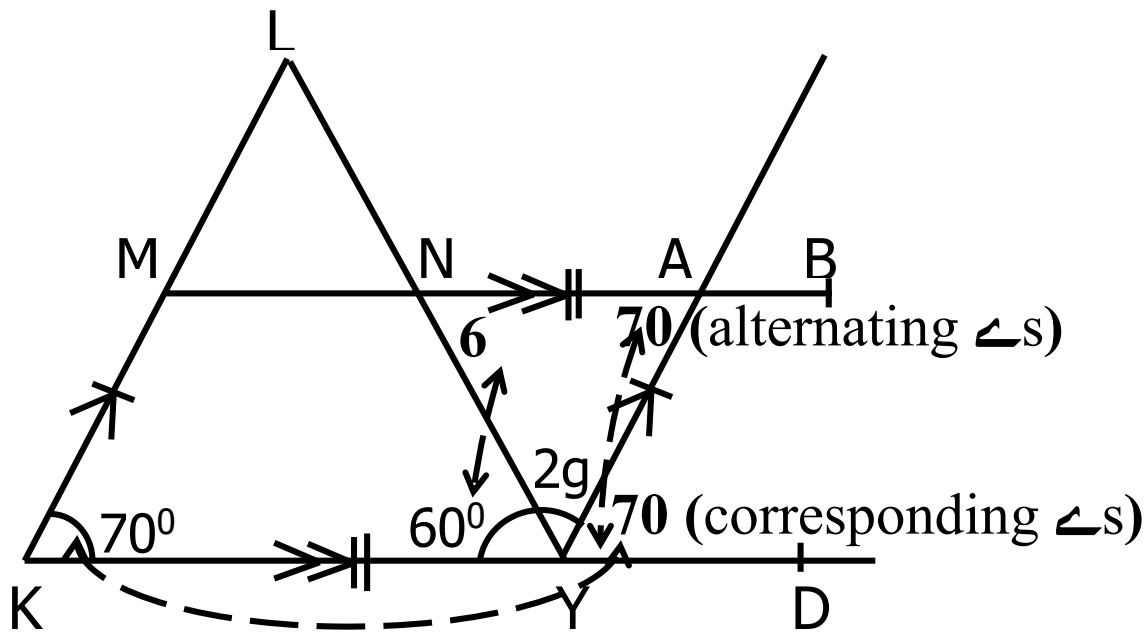
10 x sh.3600

Sh.36000

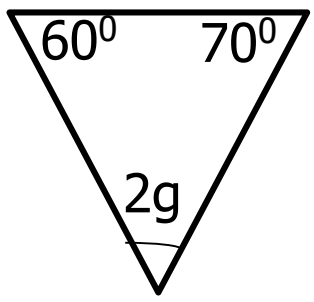
Amount paid

sh.360,000 - sh.36000
sh.324,000

29. In the diagram below, **MKYA** is a parallelogram, line **KL** is parallel to **YA**, angle **LKY**= 70^0 and **LYK** = 60^0.

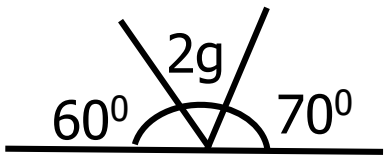


(a) Find the value of g. (02 Marks)



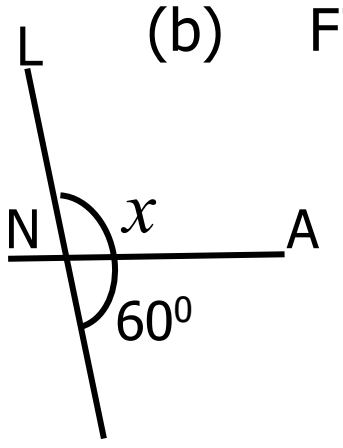
Angle sum of triangle

$2g + 60^0 + 70^0 = 180^0$
$2g + 130^0 = 180^0$
$2g + 130^0 - 130^0 = 180^0 - 130^0$
$2g = 50^0$
$\frac{2g}{2} = \frac{50^0}{2}$
$g = 25^0$



Angles on a straight line

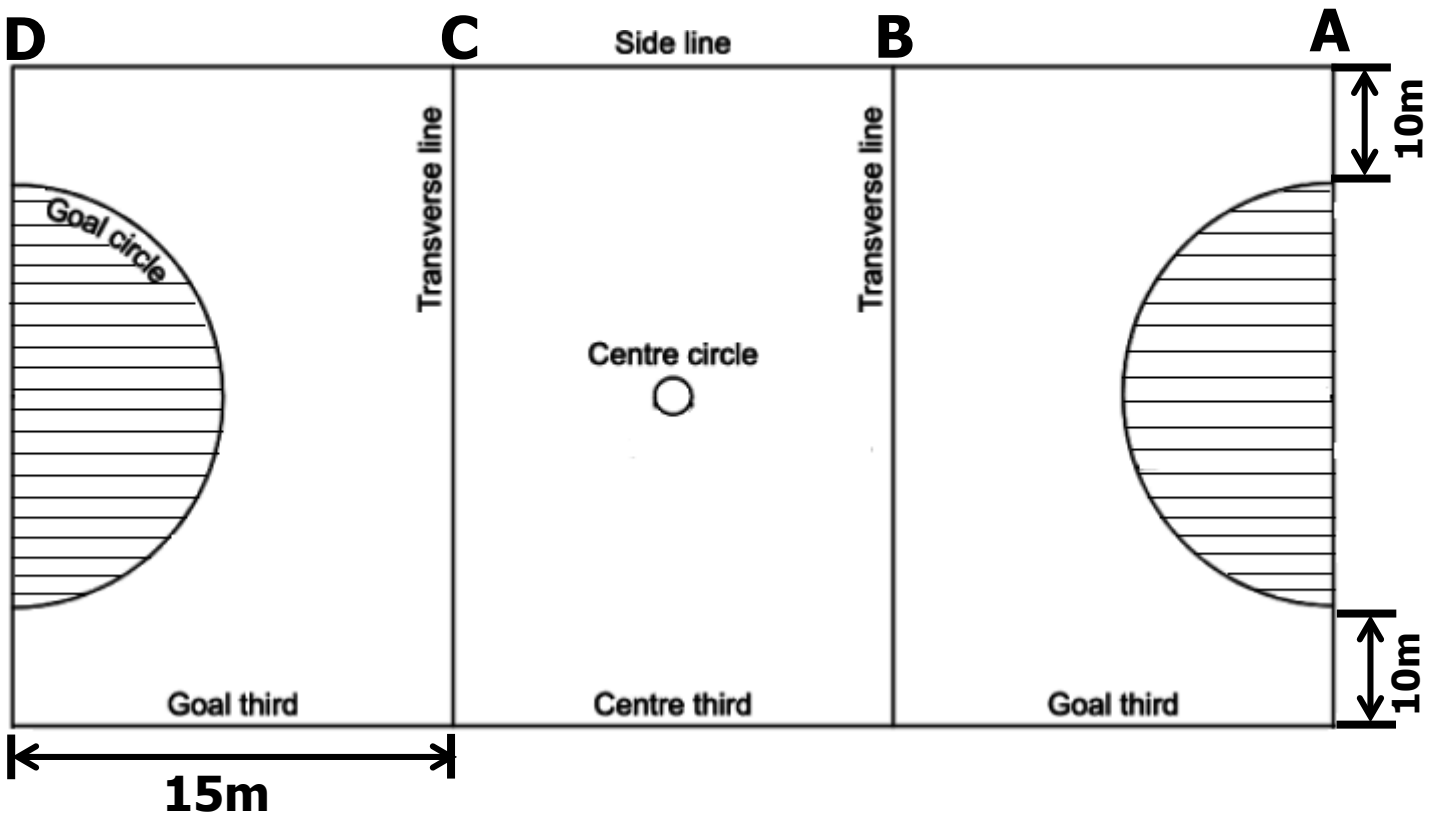
(b) Find the size the angle LNA. (02 Marks)



Let angle LNA be x

$x + 60^0 = 180^0$ (angles on a straight line)
$x + 60^0 - 60^0 = 180^0 - 60^0$
$x = 120^0$

30. The figure below is of a Netball Pitch where Nansubuga trains from. Study it and answer the questions that follow. (Using π as $\frac{22}{7}$)



(a) If the area covered by the two shaded goal semi-circles is $154m^2$, calculate the width of the pitch. (02 Marks)

NB: The two goal semi-circles make up one circle

πr^2 = Area

$\frac{22}{7} r^2 = 154m^2$

$\frac{\cancel{7}}{\cancel{22}} \times \frac{\cancel{22}}{\cancel{7}} r^2 = \cancel{154}^{7}m^2 \times \frac{7}{\cancel{22}_{1}}$

$r^2 = (7 \times 7)m^2$

$\sqrt{r^2} = \sqrt{49m^2}$

$r = 7m$

Diameter = r + r
= 7m + 7m
= 14m

Width of the pitch

10m + 14m + 10m

34m .

OR: Area of one semi-circle

$\frac{1}{2}\pi r^2 = \frac{154}{2}m^2$

$\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{22}^{11}}{7} r^2 = \frac{\cancel{154}^{77}}{\cancel{2}_{1}}m^2$

$\frac{11}{7} r^2 = 77m^2$

$\frac{\cancel{7}}{\cancel{11}} \times \frac{\cancel{11}}{\cancel{7}} r^2 = \cancel{77}^{7}m^2 \times \frac{7}{\cancel{11}_{1}}$

$r^2 = (7 \times 7)m^2$

$\sqrt{r^2} = \sqrt{49m^2}$

$r = 7m$

Diameter = r + r
= 7m + 7m
= 14m

Width of the pitch

10m + 14m + 10m

34m .

(b) During her training, Nansubuga runs at a speed of 45m/hr for 2 hours from Part **A** to **C**. Whenever she reaches **C**, she reduces her speed by 15m/hr to Part **D**. Find her average speed for the whole training session. (03 Marks)

Distance from A to C

D = Speed x Time
= 45m x 2~~hr~~
~~hr~~
= 90 metres

Time from C to D

Speed is reduced (45 – 15)m/hr
= 30m/hr

Time = Distance ÷ Speed
= 15m ÷ $\frac{30m}{1hr}$

= $\frac{\cancel{15}^{1}\cancel{m} \times 1hr}{\cancel{30}_{2}\cancel{m}}$

= ½hr

Total distance
90m + 15m = 105m
Total time
2h + ½h = 2½hr // $\frac{5hr}{2}$

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

= 105m ÷ $\frac{5hr}{2}$

= $\cancel{105}^{21}m \times \frac{2}{\cancel{5}_{1}hr}$

= 42m/hr

(c) Calculate the area of the Netball Pitch. (01 Mark)

Area = Length x Width
Area = 105m x 34m
Area = $3570m^2$.

31. The table below shows marks recorded by a teacher for a test that was done on a day when half of the pupils in the class was absent.

Marks	20	45	90	m
No.of pupils	p	2	1	3

(a) If the class has 8 boys and 12 girls, calculate the value of p. (02 Marks)

Number of pupils who did the test

$\frac{8 + 12}{2}$ = 10 pupils

NB: the class has 20pupils in total but the test was done on a day when half of the class was absent

The value of p

p + 2 + 1 + 3 = 10
p + 6 = 10
p + 6 – 6 = 10 – 6
p = 4 .

(b) Find the value of m if the mean mark of the test was 50 Marks. (03 Marks)

Mean x number = sum

$50 \times 10 = (20x4) + (45x2) + (90x1) + (mx3)$

$500 = 80 + 90 + 90 + 3m$

$500 = 260 + 3m$

$500 - 260 = 260 - 260 + 3m$

$240 = 3m$

$\frac{\cancel{240}^{80}}{\cancel{3}_{1}} = \frac{\cancel{3}m}{\cancel{3}_{1}}$

$m = 80$

OR

$\text{Mean} = \frac{\text{sum}}{\text{number}}$

$50 = \frac{(20x4) + (45x2) + (90x1) + (mx3)}{10}$

$50 = \frac{80 + 90 + 90 + 3m}{10}$

$50 \times 10 = \frac{(260 + 3m)}{\cancel{10}_{1}} \times \cancel{10}^{1}$

$500 - 260 = 260 - 260 + 3m$

$240 = 3m$

$\frac{\cancel{240}^{80}}{\cancel{3}_{1}} = \frac{\cancel{3}m}{\cancel{3}_{1}}$

$m = 80$

32. (a) Complete the table below using the equation, $y = x + 1$. (04 Marks)

x	$^{-}3$	**4**	0	**1** .....
y	**$^{-}$2**	5	**1**	2

Value of y when x is $^{-}3$

$y = x + 1$
$y = {}^{-}3 + 1$
$y = {}^{-}2$

Value of y when x is 0

$y = x + 1$
$y = 0 + 1$
$y = 1$

Value of x when y is 5

$y = x + 1$
$5 = x + 1$
$5 - 1 = x + 1 - 1$
$4 = x$
$x = 4$

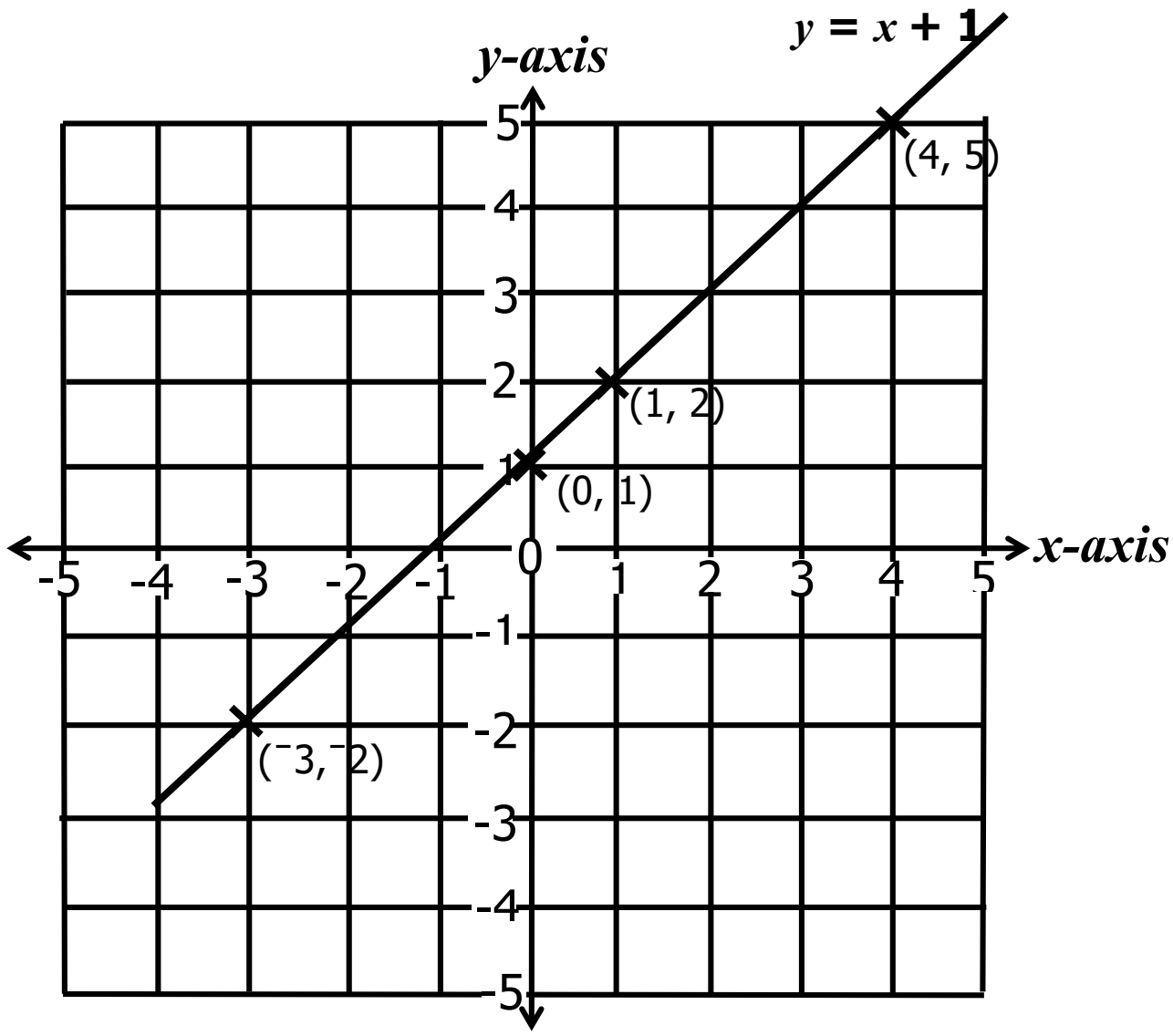
Value of x when y is 2

$y = x + 1$
$2 = x + 1$
$2 - 1 = x + 1 - 1$
$1 = x$
$x = 1$

(b) Plot the points in the table above on the co-ordinates graph below and join them to form a straight line. (02 Marks)

The co-ordinates are:

($^{-}3,^{-}2$) , (4, 5) , (0, 1), (1, 2)



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