SECTION A: 40 MARKS

1. Workout: 24 + 42

= 2 4
+ 4 2
6 6

2. Write "Forty-five thousand, thirteen" in figures.

= 45,000
+ 13
45,013

3. Find the value of h: 4 + 5 = h (mod 7).

4 + 5 = h (mod 7).

9 ÷ 7 = 1 rem 2

h = 2(mod7)

4. Work out the square of the next number in the sequence:

128, 64, 32, 16, 8, ...4.....

128 ÷ 2 = 64
64 ÷ 2 = 32
32 ÷ 2 = 16
16 ÷ 2 = 8
8 ÷ 2 = 4

5. If set D = { p, e, n}, list all the proper subsets in D.

= { }, {p}, {e}, {n}, {p, e}, {p, n}, {e, n}

6. Solve the inequality: $6 - 2r > 14$.

$6 - 6 - 2r > 14 - 6$

$-2r > 8$

$\frac{-2r}{-2} < \frac{8}{-2}$

$r < -4$

7. The scientific notation of a number is 6.5×10^{-3}. Find the number.

6.5×10^{-3}

$= \frac{65}{10} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10}$

$= \frac{65}{10,000}$

= 0.0065

8. By selling a dress for Sh. 45,000, a boutique attendant gains sh. 5,600. Calculate the cost price of the dress.

Cost Price = Selling price - Profit

= sh.~~45~~,000
- sh. 5,600
sh.39,400

9. The area of a rectangular piece of land is 250,000 square centimetres. What is the area of the same piece of land in square metres?

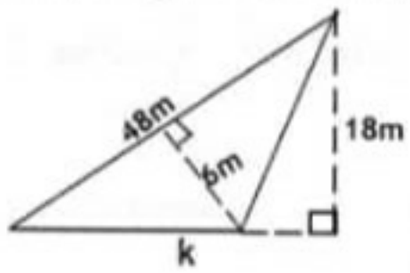
1m	=	100cm
$1m^2$	=	100cm x 100cm
$1m^2$	=	10,000cm2
$10,000cm^2$	=	$1m^2$

$1cm^2$	=	$\frac{1}{10,000}\ cm^2$
$250,000cm^2$	=	$\frac{1}{10,000} \times 250,000$
	=	$25m^2$

10. Write 0220 hours in 12 hour clock.

=	HRS	MIN
	02	20
	- 00	00
	02	20 am

11. Study the figure below carefully and use it to find the value of **k** in metres.



$\frac{B \times H}{2} = \frac{B \times H}{2}$

$\frac{48m \times 6m}{2} = \frac{k \times 18m}{2}$

$\frac{144m^2}{9m} = \frac{9mk}{9m}$

K = 16m

(b) If he asked for two thousand shilling notes, how many notes would he get for all the amount of money withdrawn? *(01 Mark)*

sh.526,000 / sh.2,000

263 notes

23. A triangle, a square and a pentagon has a total area of $96dm^2$. The area of the shapes are in the ratio of their number of sides respectively. Find the area of each shape. *(04 marks)*

	Triangle	Square	Pentagon	Total ratio
No. of sides	3	4	5	12

Area for a triangle

$\frac{3}{12_1} \times \frac{8}{96}dm^2$

$(3 \times 8)dm^2$

$24dm^2$

Square

$\frac{4}{12_1} \times \frac{8}{96}dm^2$

$(4 \times 8)dm^2$

$32dm^2$

Pentagon

$\frac{5}{12_1} \times \frac{8}{96}dm^2$

$(5 \times 8)dm^2$

$40dm^2$

24. (a) Given that $123_{five} + d = 1012_{five}$, find the value of d. *(02 Marks)*

$d = 1012_{five} - 123_{five}$

334_{five}

$5 + 2 = 7$

$7 - 3 = 4$

$5 - 5 = 3$

$4 - 1 = 3$

OR

$123_{five} + d = 1012_{five}$

$123_{five} - 123_{five} + d = 1012_{five} - 123_{five}$

$d = 1012_{five} - 123_{five}$

1012_{five}

$- 123_{five}$

334_{five}

(b) Convert 134_{eight} into binary system *(03 Marks)*

Base eight to base ten

8^2	8^1	8^0
1	3	4

$(1 \times 8^2) + (3 \times 8^1) + (4 \times 8^0)$

$1 \times 8 \times 8 + 3 \times 8 + 4 \times 1$

$64 + 24 + 4$

92_{ten}

B	N	R
2	92	
2	46	0
2	23	0
2	11	1
2	5	1
2	2	1
	1	0

1011100_{two}

25. (a) Tabira left Kiryokya town at 4:45pm. He drove his car at a steady speed of 80 Kilometres per hour for 1½ hours from Kiryokya town to home. At what time did he reach home? *(02 Marks)*

4: 45p.m. + $1\frac{1}{2}$ hr

HRS	MIN
4	45
+ 1	30
6	15

45 + 30

= 75

75 – 60

= 15

He reached home at 6:15p.m.

(b) If the cost of petrol was sh.3,000 per litre and he used one litre of petrol to cover 3km. Find the cost of petrol for the journey from town to his home. *(03 Marks)*

Total distance covered

Speed x Time

$80\frac{km}{hr} \times 1\frac{1}{2}hr$

$\frac{40}{80}\frac{km}{hr} \times \frac{3}{2}hr_1$

40km x 3

120km

3km ⟶ 1litre

1km ⟶ $\frac{1}{3}$ litres

120km ⟶ $(\frac{1}{3_1} \times \frac{40}{120})$ litres

40 litres

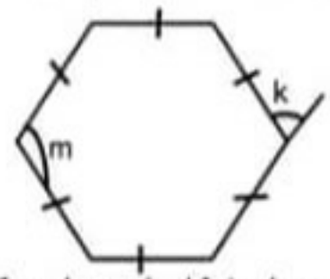
Cost of petrol

1 litres costs sh.3,000

40 litres cost sh.3,000 x 40

= sh.120,000

26. The figure below is a regular polygon with angles marked **m** and **k**. Study and use it to answer questions that follow.



(a) Find the value of angle marked **k** in degrees. *(02 Marks)*

No. of sides = $\frac{360^0}{\text{Ext}\angle}$

6 sides = $\frac{360^0}{k}$

$6 \times k = \frac{360^0 \times k}{k}$

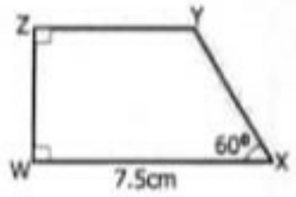
$6k = 360^0$

$\frac{6}{6_1}k = \frac{360_{60}}{6_1}$

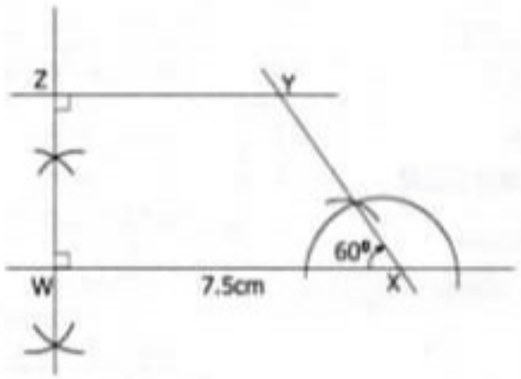
$k = 60^0$

28. (a) Using a ruler, a pencil and a pair of compasses only, construct a quadrilateral **WXYZ** where line segment **WX** = 7.5cm, angle **XWZ** = **WZY**=90°, line **WZ** = 4cm and angle **WXY** = 60°.

(05 Marks)



Actual diagram



(b) Measure the length **XY**. 4.4 | 4.5 | 4.6 cm *(01 Mark)*

29. (a) The mean mass of Amos, Joshua, Amon and Jethro is 70kg.Joshua is 60kg, and Jethro is 90kg.Find the mass of Amos if Amon is as heavy as Jethro. *(03 Marks)*

Total weight of 4 boys

70kg x 4

280kg

Joshua	Jethro	Jos+ Jeth	Amon	Amos
60kg	90kg	60kg + 90kg 150kg	As heavy as Jethro = 90kg	280kg – (150kg + 90kg) 280okg – 240kg = 40kg

(b) Find the average of m, m – 4, m – 2 and m – 6. *(02 Marks)*

Average = $\frac{\text{sum of data}}{\text{No. of items}}$

$= \frac{m + m - 4 + m - 2 + m - 6}{4}$

$= \frac{m + m + m + m - 4 - 2 - 6}{4}$

$\frac{{}^{1}4m \ - 12^{-3}}{4_{1}}$

$m - 3$

30. Hakim and Nuriat take 2 days to weed a garden of crops. If Hakim alone can weed the same garden in 6 days, how long can Nuriat take to weed the same garden? *(04 Marks)*

Let the time taken by Nuriat alone be x.

Product of the two = Total days sum of the two

Hakim x Nuriat = 2days

Hakim + Nuriat

$\frac{6 \times x}{6 + x} = 2$

$\frac{6x}{6 + x} = 2$

$\frac{(6+x)}{1} \times \frac{6x}{(6+x)_1} = 2(6 + x)$

$6x = 2(6 + x)$

$6x = 12 + 2x$

$6x - 2x = 12$

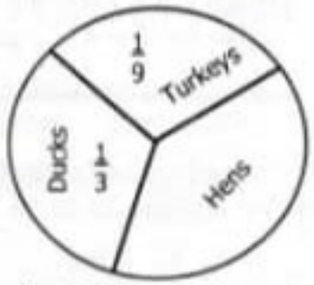
$4x = 12$

$\frac{4x}{4} = \frac{12}{4}$

$x = 3$

:. Nuriat alone take 3 days.

20. The circle graph below show different kinds of poultry birds kept by Mr. SSemakula. Study it carefully and answer questions that follow.



If there are 150 hens kept, how many poultry birds does he have altogether?

Fraction of hens

$1 - (\frac{1}{9} + \frac{1}{3})$

$1 - \frac{1+3}{9}$

$\frac{1}{1} - \frac{4}{9}$

$\frac{9-4}{9}$

$\frac{5}{9}$

Number of poultry birds

$150 \div \frac{5}{9}$

$\cancel{150} \times \frac{9}{\cancel{5}}$

$= 30 \times 9$

$= 270$ poultry birds

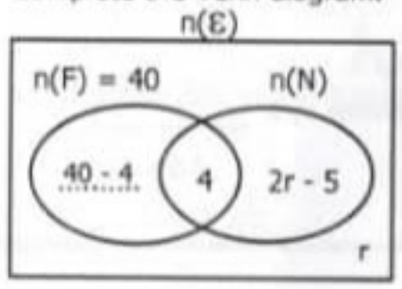
SECTION B: 60 MARKS

Answer **all** questions in this section

Marks for each question are indicated in brackets.

21. The diagram below shows the number of players in a school team who participated in football (F), netball (N) and other games.

(a) Complete the Venn diagram. *(01 Mark)*



(b) If 37 players did not participate in football, find the value of r. *(02 Marks)*

$2r - 5 + r = 37$

$2r + r - 5 = 37$

$3r - 5 = 37$

$3r - 5 + 5 = 37 + 5$

$\frac{3r}{3} = \frac{42}{3}$

$r = 14$

(c) If a player is selected at random to be a team captain, what is the probability that the one selected participated in netball? *(03 Marks)*

Pupils in school team

$= 40 + 2r - 5 + r$

$= 40 + (2 \times 14) - 5 + 14$

$= 40 + 28 - 5 + 14$

$= 40 + 23 + 14$

$= 77$

Pupils who play netball

$= 4 + (2 \times 14) - 5$

$= 4 + 28 - 5$

$= 4 + 23$

$= 27$

Probability $= \frac{n(DC)}{n(TC)}$

$= \frac{27}{77}$

22. A school bursar at Rwebikoona Primary school withdrew some amount of money from ABSA bank and the cashier gave him notes and coins as follows.

8 fifty thousand shilling notes

6 twenty thousand shilling notes

12 five hundred shilling coins

(a) How much money did he withdraw altogether? *(04 Marks)*

Fifty thousand notes

8 x sh.50,000

=sh.400,000

Twenty thousand notes

6 x sh.20,000

= sh.120,000

Five hundred coins

12 x sh.500

=sh.6000

Total withdrawal

sh. 400,000

sh. 120,000

+ sh. 6,000

sh. 526,000

(b) Find the value of angle marked **m** in degrees? *(02 Marks)*

$m + 60^0 = 180^0$

$m + 60^0 - 60^0 = 180^0 - 60^0$

$\underline{m = 120^0}$

(c) How many right angles can be formed in the regular polygon given? *(02 Marks)*

No. of right angles $= 2(n - 2)$

$= 2(6 - 2)$

$= 2(4)$

$\underline{= 8 \text{ right angles}}$

OR

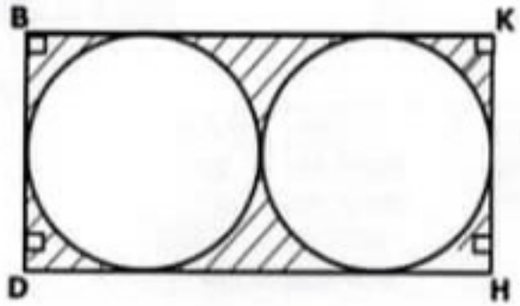
$2n - 2$

$(2 \times 6) - 4$

$12 - 4$

$\underline{8 \text{ right angles}}$

27. The area of the two equal circles in the rectangle BDHK below is $308cm^2$. Study it carefully and calculate the area of the shaded part. (Use π as $\frac{22}{7}$) *(05 Marks)*



Area of one circle

$\frac{308cm^2}{2}$

$\underline{154cm^2}$

Diameter of one circle

$\pi r^2 = \text{Area}$

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

$\frac{1}{\cancel{22}_1} \times \frac{\cancel{2}^1}{\cancel{7}_1} r^2 = \cancel{154}^{7}cm^2 \times \frac{7}{\cancel{22}_1}$

$r^2 = 7cm^2 \times 7$

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

$r = 7cm$

diameter $= 7cm + 7cm$

$= \underline{14cm}$

Length of the rectangle

$14cm + 14cm$

$28cm$

Width of the rectangle

$14cm$

Area of the rectangle

$L \times W$

$28cm \times 14cm$

$= 392cm^2$

Area of the shaded part

Area of the rectangle – Area of two circles

$392cm^2$

$-\ \underline{308cm^2}$

$\underline{84cm^2}$

12. A teacher wrote cards as shown below.

M	A	T	H	E	M	A	T	I	C	I	A	N

He placed them in a container and then told a pupil to select at random. What is the probablility that a pupil selected a card with letter "A"?

$$\text{Probability} = \frac{n(DC)}{n(TC)} = \frac{3}{13}$$

13. Work out: $2\frac{3}{4} + 1\frac{2}{3}$

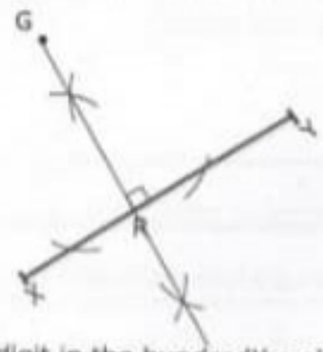
$= \frac{11}{4} + \frac{5}{3}$ LCD = 12

$= \frac{33 + 20}{12}$

$= \frac{53}{12}$ (4 rem 5)

$= 4\frac{5}{12}$

14. Using a ruler, a pencil and a pair of compasses only, drop a perpendicular from point **G** to meet line segment **X Y** at point **R**.



15. Find the value of the digit in the hundredths place in the number 534.6281

H T O Tths Hths Thths

5 3 4 . 6 2 8 1

$\downarrow 2 \times \frac{1}{100}$

$\frac{2}{100}$

$= 0.02$

16. Simplify: 4a – 5b + 3a – 2b.

$= 4a + 3a - 5b - 2b$

$= 7a - 7b$

17. The ministry of health reported to the public that the number of active cases for COVID–19 increased from 27 to 45. In what ratio did the number increase?

$$\text{Ratio} = \frac{\text{New}}{\text{Old}} = \frac{45^{5}}{27_{3}} = \frac{5}{3} = 5:3$$

18. Mr. Lubega is to plant 21 orange trees in his compound in a straight line. What interval should he use to cover a distance of 80 metres?

$$\text{Interval} = \frac{80m}{(21-1)} = \frac{\overset{4}{\cancel{80}}m}{\underset{1}{\cancel{20}}} = 4m$$

19. Without dividing, show which of the numbers 791 and 3,438 is divisible by 6.

$7 + 9 + 1 = 17$

$3 + 4 + 3 + 8 = 18$

18 is divisible by 2 and 3,

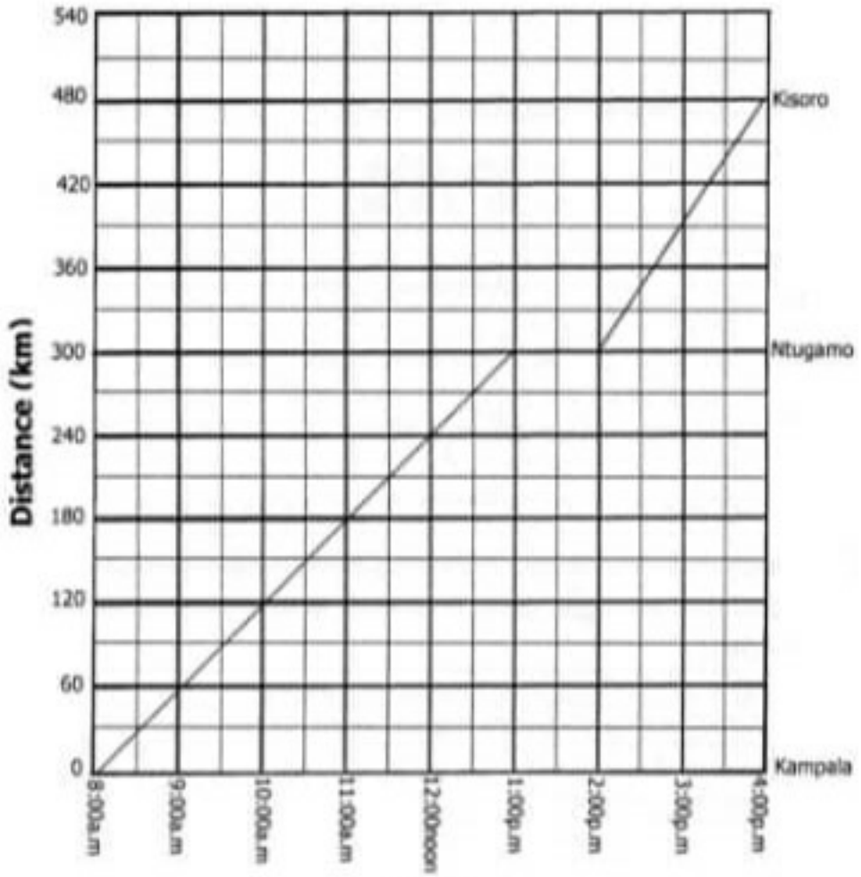
Therefore, 3438 is divisible by 6

31. A bus driver left Kampala at 8:00am for Kisoro town. He travelled at a speed of 60km/h for 5 hours to Ntugamo town. He rested for one hour at Ntugamo town and then drove at 90km/h for 2 hours until he reached Kisoro town.

Draw a travel graph to show this information. *(05 Marks)*

Vertical scale: One small square represents 30Km

Horizontal scale: One small square represents 30 minutes.



From kampala to Ntungamo

D = S x T

= $66\frac{km}{\cancel{hr}}$ x 5$\cancel{hr}$

= 60km x 5

300km

Ntungamo to Kisoro

D = S x T

= $90\frac{km}{\cancel{hr}}$ x 2$\cancel{hr}$

= 90km x 2

180km

32. (a) A half of Kato's age and $\frac{1}{3}$ of John's age now sum up to 66 years. If John is 18 years older than Kato, how old is John now? *(03 Marks)*

Let Kato's age be k

Kato ⟶ (k)yrs

John ⟶ (k + 18)yrs

Now

Kato	John	Sum
$\frac{1}{2}$ x k	$\frac{1}{3}$ x (k + 18)	66yrs
$\frac{k}{2}$	$\frac{k+18}{3}$	

$\frac{k}{2} + \frac{k}{3} + 18 = 66$ LCD = 6

$\cancel{6}^{3} \times \frac{k}{\cancel{2}_{1}} + \cancel{6}^{2}(\frac{k}{\cancel{3}_{1}} + 18) = 6 \times 66$

3k + 2(k + 18) = 396

3k + 2k + 36 = 396

5k + 36 = 396

5k + 36 - 36 = 396 -36

5k = 360

$\frac{\cancel{5}^{1}k}{\cancel{5}_{1}} = \frac{\cancel{360}^{72}}{\cancel{5}_{1}}$

k = 72

John's age now

$\frac{k + 18}{3}$

$\frac{72 + 18}{3}$

$\frac{\cancel{90}^{30}}{\cancel{3}_{1}}$

30years

(b) What is half of Kato's age now? *(01 Mark)*

$\frac{1}{2}$ of (k)yrs

$\frac{1}{\cancel{2}_{1}} \times \cancel{72}^{36}$

36years