SECTION A: 40 MARKS

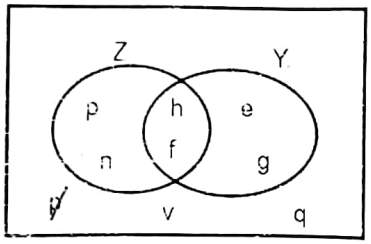
Questions 1 to 20 carry two marks each

1. Work out: 18 ÷ 3 using repeated subtraction.

$18 - 3 = 15$ ①
$15 - 3 = 12$ ②
$12 - 3 = 9$ ③
$9 - 3 = 6$ ④
$6 - 3 = 3$ ⑤
$3 - 3 = 0$ ⑥

$18 \div 3 = 6$

2. Use the Venn diagram below to find n (Y – Z)'



$(Y - Z)' = \{p, n, v, q, h, f\}$
$n(Y - Z)' = 6$

3. Simplify: $\frac{k^{-2}}{k^{-5}}$.

$K^{-2} \div K^{-5}$
$= K^{-2--5}$
$= K^{-2+5}$
$= K^{3}$

$\frac{\frac{1}{k} * \frac{1}{k}}{\frac{1}{k} \times \frac{1}{k} \times \frac{1}{k} \times \frac{1}{k} \times \frac{1}{k}}$
$= \frac{1}{\frac{1}{k} * \frac{1}{k} \times \frac{1}{k}}$
$= k^{+3}$

4. Work out the square root of $5\frac{4}{9}$.

$5\frac{4}{9} = \frac{(5 \times 9) + 4}{9}$
$= \frac{45 + 4}{9}$
$= \frac{49}{9}$

$\sqrt{\frac{49}{9}} = \frac{7 \times 7}{3 \times 3}$
$= \frac{7}{3}$
$= 2\frac{1}{3}$

49 → 7, 7 → 7, 1
9 → 3, 3 → 3, 1

$\sqrt{\frac{49}{9}} = \frac{7^2}{3^2} = \frac{(7^1)^{1/2}}{(3^1)^{1/2}}$
$= \frac{7}{3}$
$= 2\frac{1}{3}$.

5. Work out the mean of $\frac{1}{4}$ and $\frac{1}{3}$.

$= \frac{\frac{1}{4} + \frac{1}{3}}{2}$
$= \left(\frac{1}{4} + \frac{1}{3}\right) \div \frac{2}{1}$
$= \frac{\left(\frac{1}{4} \times 12\right) + \left(\frac{1}{3} \times 12\right)}{12} \div \frac{2}{1}$
$= \frac{7}{12} \div \frac{2}{1}$
$= \frac{1}{12} \times \frac{1}{1}$
$= \frac{7}{24}$

5. Round off 99.987 to the nearest whole number

99.|987
+ 1
100.000

99.987 ≈ 100

T o Th H th T th Th
99. 987
RPV
99+1
≈ 100

7. Fred bought 6 packets of biscuits and paid sh. 54,000. How many packets of similar biscuits can Deborah buy if she has sh. 36,000.

6 packets = 54000
1 packet = 54000/6
= sh. 9000.

Qty | Amount/Unit Cost
1 packet | 9000
= 36000/9000
= 4 packets.

8. What angle is $\frac{1}{5}$ of its supplement?

If it is 2/3, the child multiplies by 2.

Angle	Supplement	Total
a	5a	180°

a + 5a = 180°
6a = 180°
a = 180/6
a = 30°

6 parts = 180°
1 part = 180/6
= 30°

Ratio = 1/5
=1:5
Angle Supplement.

Angle | Supp | Total
$\frac{1}{5}m$ | m | 180

$\frac{1}{5}m + m = 180°$
$\frac{m}{5} + m = 180°$
$\frac{m+5m}{5} = 180°$
$\frac{6m}{5} \times 5 = 180° \times 5$

$6m = 180° \times 5$
$m = \frac{180° \times 5}{6}$
$= 30 \times 5$
$= 150$

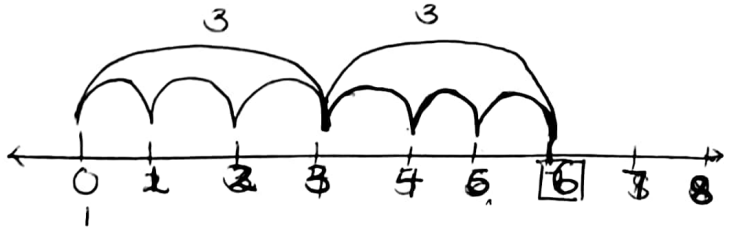
$\frac{1}{5}m = \frac{1}{5} \times m$
$= 30°$

9. The volume of a cube tank is 64m³. Find its total surface area.

Volume = S × S × S
$64m^3 = S^3$
$\sqrt[3]{64m^3} = \sqrt[3]{S^3}$
$(4 \times 4 \times 4) = S$
$4 = S$

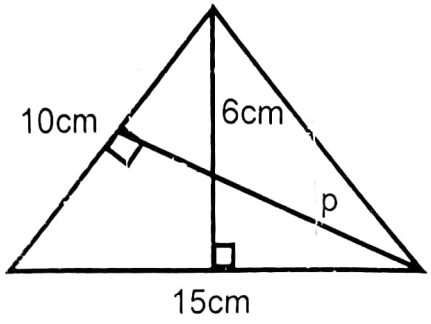
T.S.A = $6S^2$
$= 6 \times 4^2$
$= 6 \times 16$
$= 96m^2$

10. Work out **2 × 3** on a number line.



2 × 3 = 6

11. Study the figure below and use it to answer the question. Calculate the value of p.



Area = Area

$\frac{b \times h}{2} = \frac{b \times h}{2}$

$\frac{10 \times p}{2} = \frac{15 \times 6}{2}$

$\frac{10p}{2} = \frac{90}{2}$

$10p \times 2 = 90 \times 2$

$\frac{20p}{20} = \frac{90 \times 2}{20}$

$p = 9\text{cm}$

OR

$\frac{10p}{2} = \frac{90}{2}$

$\frac{10p}{10} = \frac{90}{10}$

$p = 9$

12. What is multiplicative inverse of $2\frac{1}{2}$?

let the inverse be k

$2\frac{1}{2} = \frac{5}{2}$

$k \times \frac{5}{2} = 1$

$\frac{5k}{2} = 1$

$\frac{2 \times 5k}{2} = 1 \times 2$

$\frac{5k}{5} = \frac{2}{5}$

$k = \frac{2}{5}$

OR

$= 1 \div 2\frac{1}{2} = \frac{2}{5}$

$1 \div \frac{5}{2}$

$1 \times \frac{2}{5}$

13. Ado bought 14kg of meat at sh. 7000 per half kg. how much did she pay?

$\frac{1}{2}$ kg = sh. 7000.

1 kg = 2 halves

14 kg = $14 \div \frac{1}{2}$

$= 14 \times \frac{2}{1}$

$= 28$

$= (28 \times 7000)$

$= \text{sh. } 196{,}000$

Or

$\frac{1}{2} \rightarrow 7000$

1kg → sh. 14000

14kg = sh. 14000 × 14

196000

14. Express 0.2727... as a common fraction in its simplest form.

$\frac{27}{100} - \frac{0}{1}$

$= \frac{27}{99} \; \frac{3}{11}$

$= \frac{3}{11}$

15 What number should be subtracted from 3p + 6 to give p + 13?

$(3p+6)-(p+13)$

$= 3p+6-p-13$

$= 3p-p+6-13$

$= 2p+6-13$

$= 2p-7$

$= (3p+6) - (p+13)$

$= 3p+6-p-13$

$= 3p-p+6-13$

$= 3p-p-7$

$= 2p-7$

or let the number be v

$(3p+6) - v = (p+13)$

$(3p+6)-(p+13) = v$

$3p+6-p-13 = v$

$3p-p+6-13 = v$

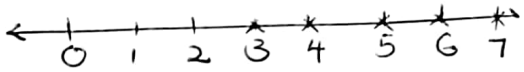
$3p-p-7 = v$

$v = 3p-p-7$

$= 2p-7$

16. Given that $9 \leq 3x \leq 21$. Solve for x and write the solution set.

$\frac{9}{3} \leq \frac{3x}{3} \leq \frac{21}{3}$



$3 \leq x \leq 7$

$x = \{3, 4, 5, 6, 7\}$

17. Change 40m/s to km/hr.

Km/h	18	36	54	72	90	108	126	144
m/s	5	10	15	20	25	30	35	40

~~for 40m in 2m,~~

$1m = \frac{1}{1000}km$, $1sec = \frac{1}{3600}hr$

$= \left(\frac{1}{1000} \times 40\right) \div \left(\frac{1}{3600} \times 1\right)$

$= \left(\frac{1}{1000} \times 40\right) \times \left(\frac{3600}{1}\right)$

$= 4 \times 36$

$= 144km/h$

18. Given set M = {1, 2, 3, 4, 5}. Find the number of subsets in set M.

No of $\subseteq = 2^n$

$n = 4$

$\subseteq = 2 \times 2 \times 2 \times 2$

$\subseteq = 16 \times 2$

No of $\subseteq = 32$ subsets

19. A car took $3\frac{1}{4}$ hours on the way. If it reached its destination at 1:15p.m. At what time did it begin this journey?

$D = 3\frac{1}{4}$

$= 3 + \left(\frac{1}{4} \times 60\right)$

$= 3hr$ and $15min$

Duration = Ending time - starting time

Starting time = Ending time - Duration

$= 1315 - 315$

$= 1000$ hours

$= 10:00am$

$\begin{array}{r} 115 \\ 1200 \\ \hline 1315hrs \end{array}$ $D = 3:15.$ $=$

20. Find the highest number of girls that can share 12 apples or 16 apples exactly without leaving a remainder in each case.

2	12 16
2	6 8
2	3 4
2	3 2
3	3 1
	1 1

2	2	2 6
2	2	6 8
		3 4

$= (2 \times 2) + Rem$

$= 4 + 0$

$= 0.$

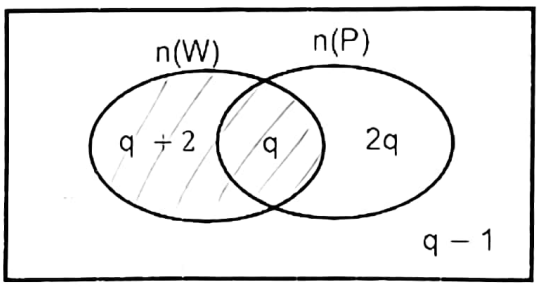
$m/s \rightarrow Km/s.$

$\left(\frac{Given\ m/s}{1000} \times 3600\right)$

SECTION B: 60 MARKS

Marks for each question are indicated in the brackets

21. The Venn diagram below shows the number of pupils who like watermelon (W) and pumpkin (P). Use it to answer the questions that follow.



a) If 17 pupils do not like watermelon, find the value of q. **(03 marks)**

$2p + p - 1 = 17$ M√

$3p - 1 = 17$

$3p - 1 + 1 = 17 + 1$

$3p = 18$

$\frac{3p}{3} = \frac{18}{3}$ B√

$p = 6$ A√

b) Find the total number of pupils in the class. **(02 marks)**

$= (6+2) + 6 + 12 + (6-1)$ M√

$= 8 + 6 + 12 + 5$

$= 14 + 17$

$= 31$ pupils. A√

22. a) Work out: $\frac{3.9 + 3.6}{0.06 \times 0.5}$ **(03 marks)**

$= \left(\frac{39}{10} + \frac{36}{10}\right) \div \left(\frac{6}{100} \times \frac{5}{10}\right)$ M√ with brackets.

$= \left(\frac{39+36}{10}\right) \div \left(\frac{30}{1000}\right)$

$= \frac{75^{25}}{10} \times \frac{1000}{30}$ M√

$= 25 \times 10$

$= 250$ A√

08

b) Express $\frac{4}{15}$ as a recurring decimal. **(02 marks)**

$4/15 = 15\overline{)4}$ → 0.266 M ✓

0 × 4 = 0, 40

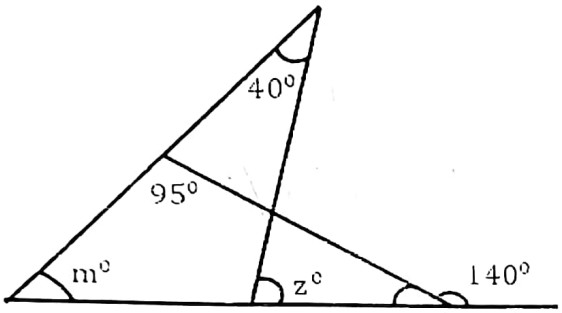
2 × 15 = 30, 100

6 × 15 = 90, 100

6 × 15 = 90, 10

$\frac{4}{15} = 0.266...$ A ✓

23. Study the diagram below and answer the questions that follow.



a) Find angle m. **(02 marks)**

$m° + 90° = 140°$ M ✓

$m° + 95° - 95° = 140° - 95°$

$m = 45°$

$m = 45°$ A ✓

b) Find angle z. **(02 marks)**

$m + 40° = z°$ M ✓

$45° + 40° = z$

$z = 85°$ A ✓

(c) The exterior angle of a regular hexagon is 2h + 4. Find the value of h. **(02 marks)**

$\text{Ext} < = \frac{360°}{\text{No. of sides}}$

$= 360/6$ M ✓

$= 60°$

$2h + 4 = 60$

$2h + 4 - 4 = 60 - 4$

$2h = 56$

$\frac{2h}{2} = \frac{56}{2}$

$h = 28°$ A ✓

Number of Sides $= \frac{360°}{\text{Ext} <}$

$\frac{6}{1} \times \frac{360°}{2h+4}$ M ✓

$\frac{6(2h+4)}{6} = \frac{360°}{6}$

$2h + 4 = 60°$

$2h + 4 - 4 = 60° - 4$

$\frac{2h}{2} = \frac{56°}{2}$

$h = 28°$ A ✓

08

24. Caiden travelled at a speed of 60km/h for 2 hours from town Jinja to town Mukono and then continued to town Kampala at a speed of 70km/h for 3 hou Calculate the average speed for the whole journey. **(04 marks)**

Average speed = Total distance Covered / Total time taken

= 120km + 210km M ✓ / 2hrs + 3hrs

= 330 km / 5hrs B

= 66km/h A ✓

Distance to Mukor
D = S x T
= 60 x 2 B ✓
= 120km

Distance to kampala
= 70 x 3
= 210km B ✓

25. A woman bought the following items

- 3kg of posho at sh. 2400 per kg.
- 500g of salt at sh. 1200 per kg.
- 12 apples at sh. 3000 for every 3 apples
- 4 tins of blue band at sh. 10,000.

a) What was her possible total expenditure? **(04 marks)**

Posho	Salt	Apples	Blue band
= 3 x sh. 2400	= 500g/1000 x 1200	= 12/3 = 4	= sh. 10,000
= sh. 7200 B	= 5 x 120	= sh. 3000 x 4	
	= sh. 600 B	= sh. 12000 B	

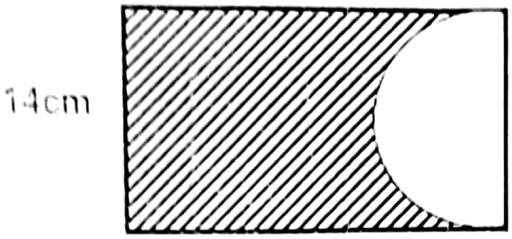
Total expenditure
= sh. 12000
sh 10 000
+ sh. 7200
sh 600
29800
= Sh. 29,800. A ✓

b) If she was given a discount of 10%, Find his actual expenditure. **(02 marks)**

= (100% - 10%)
= 90% M ✓
= 90%/100 x 29800
= sh. 26,820 A ✓

10

26. Use the figure below to answer the questions that follow.



a) Calculate the area of the unshaded figure. **(02 marks)**

Area $= \frac{1}{2}\pi r^2$

D = 14cm

r = 7cm

$A = \frac{1}{2} \times \frac{22}{7} \times 7 \times 7$ my ✓

$= (11 \times 7)cm^2$

$= 77cm^2$ Ay ✓

b) Find the area of the shaded part. **(03 marks)**

Area of shaded = Total area - Area of unshaded

$= (L \times W)$ (for 420cm²) my — 77cm²

$= (30 \times 14)cm^2 - 77cm^2$

$= 420cm^2$ my 77cm² ✓

$= 343cm^2$ Ay ✓

420 − 77 = 343.

27. a) A P.5 pupil wrote 1, ⁻4, 0, ⁻1 and 2 on a piece of paper. Arrange them in ascending order. **(02 marks)**

$= (-4, -1, 0, 1, 2)$ Bz ✓

07

b) The median of four consecutive even numbers is15. If the fourth number is 2p, find the value of p. **(03 marks)**

1st	2nd	3rd	4th	Total
2p-6	2p-4	2p-2	2p	

$\frac{(2p-4)+(2p-2)}{2} = 15$ M

$\frac{2}{1} \times \frac{2p-4+2p-2}{2} = 15 \times 2$

$2p + 2p - 6 = 30$

$4p - 6 = 30$

$4p - 6 + 6 = 30 + 6$

$\frac{4p}{4} = \frac{36}{4}$ M

$p = 9$ A ✓

28. a) Given that b = $^{-}12$ and n = y = 3. Evaluate 2bn ÷ y. **(02 marks)**

$b = -12, n = y = 3$

$2bn \div y$

$= \frac{2bn}{y}$

$= \frac{2 \times -12 \times 3}{3}$ M ✓

$= -24$ A ✓

(b) Charles is 6 years younger than Audrey. The difference between a half of Charles's age and a quarter of Audrey's age is a year. Find the Charles's age. **(03 marks)**

Let Audrey's age be a.

	Charles	Audrey	Total
	a - 6	a	
Diff	$\frac{a-6}{2}$	$\frac{a}{4}$	1

$\frac{a-6}{2} - \frac{a}{4} = 1$ M ✓

$\frac{2(a-6)}{2} \times \frac{2}{4} - \frac{a}{4} \times 4^{1} = 1 \times 4$

$2(a-6) - a = 1$

$\frac{2a-12-a}{4} = 1$

$\frac{4}{1} \times \frac{2a-a-12}{4} = 1 \times 4$ M ✓

$a - 12 = 4$

$a - 12 + 12 = 4 + 12$

$a = 16$ B ✓

Charles = a - 6

= 16 - 6

= 10 years ✓

29. a) Expand 523.42 using powers of ten. **(02 marks)**

$\times 10^{2} \times 10^{1} \times 10^{0} \times 10^{-1} \times 10^{-2}$

523.42

$(5 \times 10^{2}) + (2 \times 10^{1}) + (3 \times 10^{0}) + (4 \times 10^{-1}) + (4 \times 10^{-2})$ B2 ✓

09

b) Work out (47 ÷ 2) – (23 ÷ 2) using distributive property.

(02 marks)

$= (47 - 23) \div 2$ M

$= 24 \div 2$

$= 12$ A

30. The table below shows marks scored by some pupils in the beginning of term two examinations. Study it and answer the questions that follow.

Marks	90	60	80	70
Number of pupils	2	5	4	4

a) Find the modal mark **(01 mark)**

= 90, 90, 60, 60, 60, 60, 60, 80, 80, 80, 80, 70, 70, 70, 70

Modal mark = 60 B

b) Find their range. **(01 mark)**

Range = Highest - Lowest

= 90 - 60

= 30 B

c) Calculate the average mark. **(03 marks)**

Average = $\frac{\text{Sum of data}}{\text{Number of data}}$

$= \frac{(90 \times 2) + (60 \times 5) + (80 \times 4) + (70 \times 4)}{15}$ M

$= \frac{180 + 300 + 320 + 280}{15}$

$= 1080/15$ M

Average mark = 72 A

07

31. Jengo, James and Jingo shared some money in the ratio of 3:5:4 respectively. If James got sh.8,000 more than Jengo, how much money did they share altogether? (5 marks)

Jengo	James	Jingo	Total
3	5	4	12
3n	5n	4n	12n

James − Jengo (for the difference)
5n − 3n = sh. 8000
2n = sh. 8000
n = sh. 8000/2
n = 4000

Total ratio
3 + 5 + 4 = 12

Jengo = 3n
= 3 × 4000
= sh. 12000

James = 5n
= 5 × 4000
= sh. 20,000

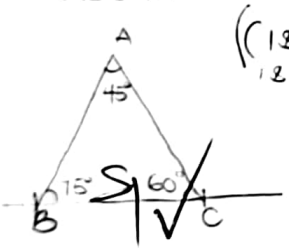
Jingo = 4n
= 4 × 4000
= 16000.

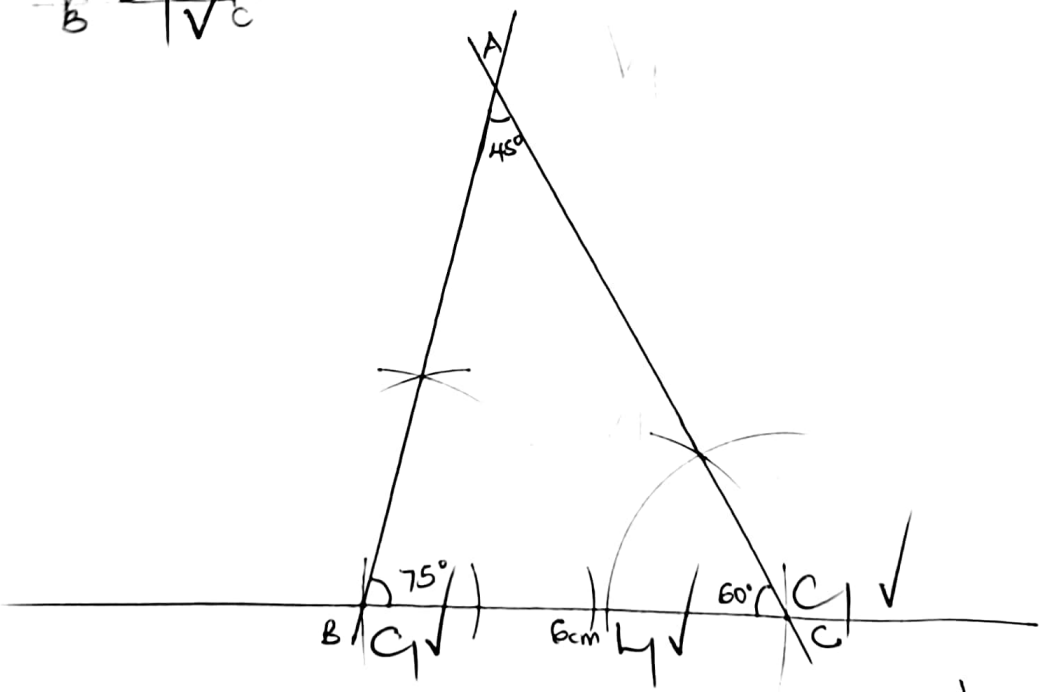
12n = 12 × 4000
= 48000

12000 + 20000 = 16000
12000 + 16000 = 28000
48000

32. a) Using a ruler, a pencil and a pair of compasses only, construct a triangle ABC where BC = 6cm, ABC=75° and BAC =45°. (04 marks)

(180 − (75° + 45°))
180 − 120°
= 60°





b) Measure line AC= 8cm (1 mark)

END

TO