



# SUREKEY EXAMINATIONS BOARD

## PRIMARY SEVEN PLE MOCK EXAMINATION

### 2023

#### MATHEMATICS GUIDE

## PREPARED BY:

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The advertisement features a collage of school-related images like books, a computer, and a calculator. A large banner across the top reads "SUREKEY EXAMINATIONS BOARD". Below it, a diagonal banner says "# P.L.E MOCKS REGISTRATION IN PROGRESS @ 8,000/-". The central logo is the same as the one at the top of the page. The text "ONLINE REGISTRATION" is prominently displayed.

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- Check your email after a few minutes for a message containing your school portal password and a link that directs you to the main Surekey Website.

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- Press the NEW STUDENT button and fill the form

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# P.L.E MOCKS REGISTRATION IN PROGRESS @ 8,000/-

## SECTION A: 40 MARKS

Answer all questions in this Section

Questions 1 to 20 carry two marks each

1. Workout:

$\begin{array}{r} 2023 \\ - 203 \\ \hline 1820 \end{array}$	$3 - 3 = 0$ $2 - 0 = 2$ $0 - 2 \text{ (impossible)}$ $10 - 2 = 8$
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2. Write the value of  $9^3$  in words.

Value of  $9^3$

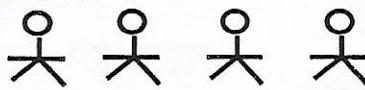
$$(9 \times 9) \times 9$$

$$81 \times 9$$

$$729$$

Seven hundred twenty-nine.

3. The diagram below shows number off pupils present in a P.7 class in three streams on a certain day at Kambugu Primary School.

Stream	Pupils present
P.7 Blue	
P.7 Yellow	
P.7 Green	

**KEY:**



represents 8 pupils.



represents 4 pupils.

How many pupils attended that day in all the three streams?

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

$$64 + 8$$


---


$$\underline{\quad 72 \text{ pupils}}$$

Alternatively

$$\text{P.7 Blue} \rightarrow 4 \times 8 = 32 \text{ pupils}$$

$$\text{P.7 Yellow} \rightarrow (2 \times 8) + 4$$

$$16 + 4 = 20 \text{ pupils}$$

$$\text{P.7 Green} \rightarrow (2 \times 8) + 4 = 20 \text{ pupils}$$

Total no. of pupils

$$32$$

$$+ 20$$

$$\hline 20$$

$$72 \text{ pupils.}$$

4. Kajjumbi paid Sh.92,000 for 4 text books. How much did he pay for each book?

$$\begin{aligned} 4 \text{ books} &\rightarrow \text{Sh. } 92,000 \\ 1 \text{ book} &\rightarrow \text{Sh. } \frac{23}{4},000 \\ &\quad \cancel{4} \\ &= \text{Sh. } 23,000 \end{aligned}$$

Also accept

$$\begin{aligned} \text{Sh. } \frac{23}{4},000 \\ \cancel{4} \\ = \text{Sh. } 23,000 \end{aligned}$$

He paid sh. 23,000 for each book.

5. Given that  $R = \{\text{first five composite numbers}\}$ ,  
 $Q = \{\text{first 5 triangular numbers}\}$

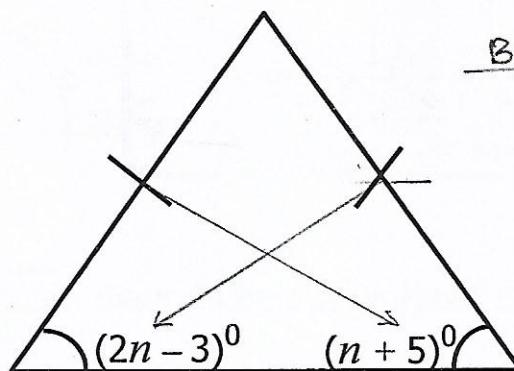
Find  $n(R \cap Q)$ .

$$\begin{aligned} R &= \{4, 6, 8, 9, 10\} \\ Q &= \{1, 3, 6, 10, 15\} \\ R \cap Q &= \{6, 10\} \\ n(R \cap Q) &= 2 \end{aligned}$$

Alternatively,

$$\begin{aligned} R &= \{4, 6, 8, 9, 10\} \\ Q &= \{1, 3, 6, 10, 15\} \end{aligned}$$

6. Find the value of  $n$  in the figure below.



Base angles are equal

$$\begin{aligned} (2n - 3)^\circ &= (n + 5)^\circ \\ 2n - 3 &= n + 5 \\ 2n - n &= 5 + 3 \\ n &= 8 \end{aligned}$$

7. The average height of Pan, Jan and Fan is 51cm. If the height of Pan is 53cm and that of Jan is 46cm, find the height of Fan.

$$\begin{aligned} S &= \text{Mean} \times \text{No.} \\ &= 51\text{cm} \times 3 \\ &= 153\text{cm} \end{aligned}$$

Fan's height

$$\begin{aligned} 153\text{cm} - (53 + 46)\text{cm} \\ 153\text{cm} - 99\text{cm} \\ 54\text{cm} \end{aligned}$$

Alternatively:

Total weight of the three

$$\begin{aligned} 51\text{cm} \times 3 \\ = 153\text{cm} \end{aligned}$$

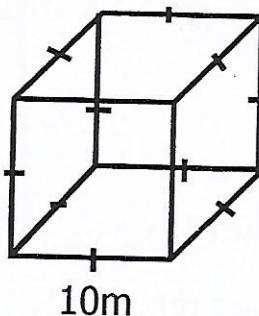
Weight of Pan and Jan

$$\begin{aligned} 53\text{cm} + 46\text{cm} \\ = 99\text{cm} \end{aligned}$$

Weight of Fan

$$\begin{array}{r} 153\text{cm} \\ - 99\text{cm} \\ \hline 54\text{cm} \end{array}$$

8. The figure below shows a cube whose edges are made of metal wire. If the length of one edge is 10m. Find the length of the wire needed to make the cube.



$$\begin{aligned}
 \text{Length of wire} &= \text{No. of edges} \times \text{side} \\
 &= 12 \times 10\text{m} \\
 &= \underline{\underline{120\text{m}}}
 \end{aligned}$$

9. Solve the inequality below and give the solution set that satisfies it.

$$3(2 - k) < 15$$

$$\begin{aligned}
 3(2 - k) &< 15 \\
 6 - 3k &< 15 \\
 6 - 6 - 3k &< 15 - 6 \\
 -3k &< 9 \\
 -\frac{1}{3}k &> \frac{9}{3} \\
 -\frac{1}{3}k &> 3
 \end{aligned}$$

$$k > -3$$

Solution set

$$\begin{array}{ccccccccccccc}
 & & & & & & & & & & & & & & \\
 \leftarrow & + & - & 3 & - & 2 & - & 1 & 0 & + & 1 & + & 2 & + & 3 & + & 4 \\
 & & & & & & & & & & & & & & & & \\
 k: k = \{ -2, -1, 0, 1, 2, 3, 4, \dots \}
 \end{array}$$

10. Workout:  $4\frac{2}{3} \div 2\frac{1}{3}$ .

$$\begin{array}{r}
 4\frac{2}{3} \div 2\frac{1}{3} \\
 \frac{14}{3} \div \frac{7}{3} \\
 \frac{14}{3} \times \frac{3}{7} \\
 \hline
 2
 \end{array}$$

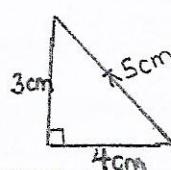
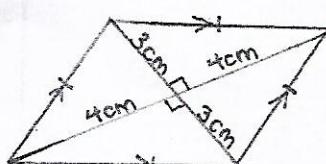
Alternatively

$$\frac{3}{3}(2-k) < \frac{15}{3}$$

$$\begin{aligned}
 2 - k &< 5 \\
 2 - 2 - k &< 5 - 2 \\
 -k &< 3 \\
 -k &> \frac{3}{-1} \\
 k &> -3
 \end{aligned}$$

$$k = \{-2, -1, 0, +1, +2, \dots\}$$

11. Calculate the perimeter of a rhombus whose longest and shortest diagonals are 8cm and 6cm respectively.



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 c^2 &= 4^2 + 3^2 \\
 c^2 &= 16 + 9 \\
 c^2 &= 25 \\
 \sqrt{c^2} &= \sqrt{25} \\
 c &= 5\text{cm}
 \end{aligned}$$

Perimeter

$$\begin{aligned}
 P &= 4 \text{ sides} \\
 P &= 4 \times 5\text{cm} \\
 P &= \underline{\underline{20\text{cm}}}
 \end{aligned}$$

12. A workshop that started at 7:30 p.m. took  $3\frac{1}{2}$  hours. At what time did it end?

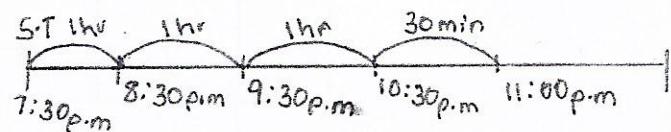
Starting time  $\Rightarrow$  7:30 p.m.

Duration = 3 hrs and 30 mins

Ending time = S.T + D

$$\begin{array}{r} \text{HRS} \quad \text{MIN} \\ \begin{array}{r} 7 \quad 30 \\ + 3 \quad 30 \\ \hline 11 \quad 00 \end{array} \end{array} \quad \left| \begin{array}{l} 30+30 \\ 60-60 \\ =00 \end{array} \right.$$

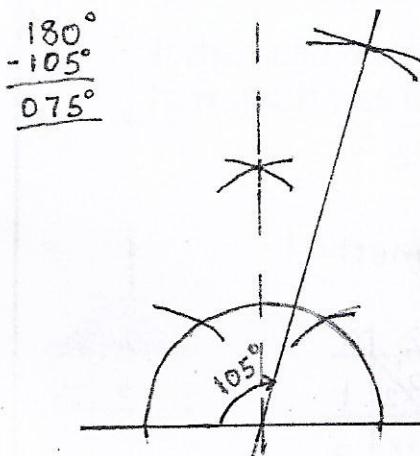
Alternatively:



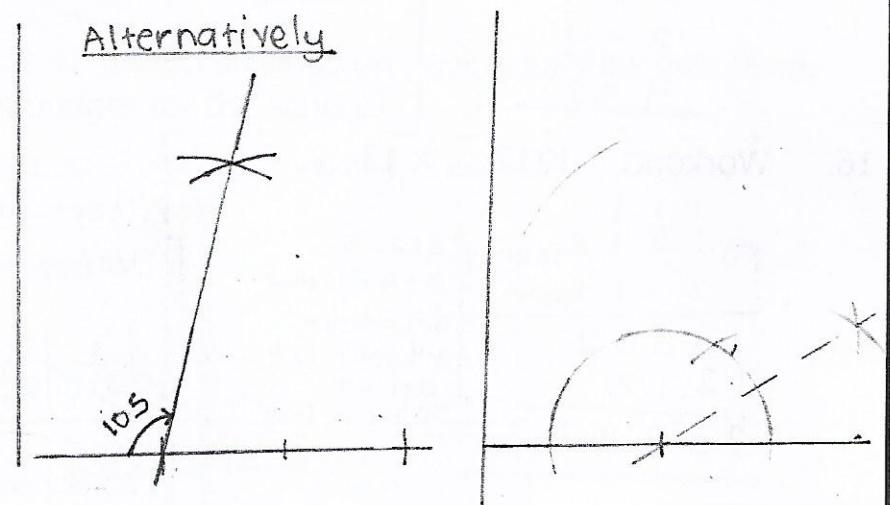
$\therefore$  Ending time is 11:00 p.m.

It ended at 11:00 p.m.

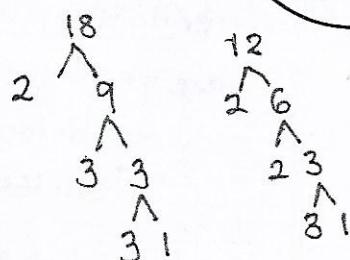
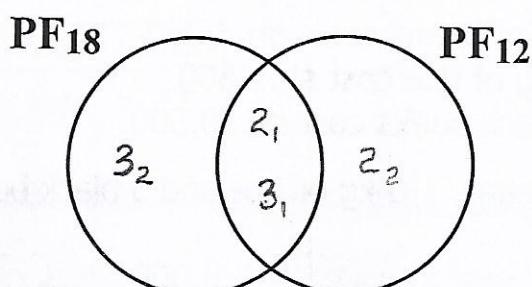
13. Using a ruler, a pencil and a pair of compasses only, construct an angle of  $105^\circ$  in the space provided below.



Alternatively:



14. Using the Venn diagram below, workout the GCF of 18 and 12.



$$\text{GCF} = n$$

$$= 2 \times 3$$

$$= 6$$

$$PF_{18} = \{2, 3, 3\}$$

$$PF_{12} = \{2, 2, 3\}$$

$$PF_{18} \cap PF_{12} = \{2, 3\}$$

15. Given that  $x = 2y + 1$ . Complete the table below.

$x$	5	9
$y$	2	4

When  $x$  is 5

$$\begin{aligned}x &= 2y + 1 \\5 &= 2y + 1 \\5 - 1 &= 2y + 1 - 1 \\ \frac{4}{2} &= \frac{2y}{2} \\2 &= y \\y &= 2\end{aligned}$$

When  $y$  is 4

$$\begin{aligned}x &= 2y + 1 \\x &= (2 \times 4) + 1 \\x &= 8 + 1 \\x &= 9\end{aligned}$$

16. Workout:  $1212_{\text{four}} \times 13_{\text{four}}$ .

$$\begin{array}{r} 1 \ 2 \ 1 \ 2_{\text{four}} \\ \times \quad 1 \ 3_{\text{four}} \\ \hline 1 \ 0 \ 3 \ 0 \ 2 \\ + 1 \ 2 \ 1 \ 2 \\ \hline 2 \ 3 \ 0 \ 2 \ 2_{\text{four}} \end{array}$$

$$\begin{aligned}3 \times 2 &= 6 \\6 \div 4 &= 1 \text{ rem } 2 \\3 \times 1 &= 3 + 1 \\&= 4 \div 4 = 1 \text{ rem } 0 \\6 + 1 &= 7 \\7 \div 4 &= 1 \text{ rem } 3\end{aligned}$$

Alternatively  
Using Lattice method

	1	2	1	2	X
0	0	0	0	0	1
2	0	1	2	1	0
3	2	1	0	3	1
0	3	2	0	2	3

$23022_{\text{four}}$

17. The list below shows prices of different items in Akaasi Supermarket.

- 1kg of beans costs sh.3,000
- 500g of rice cost sh.1,600
- 3 black books cost sh.10,500.

If Opolot buys 1kg of beans,  $1\frac{1}{2}$  kg of rice and 3 black books, how much money does he pay?

Beans  $\Rightarrow$  sh. 3,000

Pens  $\Rightarrow$  sh. 10,500

$$\frac{500\text{g}}{1000} = \frac{1\text{kg}}{2}$$

Each  $\frac{1}{2}$  kg costs sh. 1,600

$1\frac{1}{2}$  kg has  $\frac{3}{2}$  kg

$\therefore 1\text{ part} \rightarrow \text{sh. 1,600}$

$$\begin{aligned}3\text{ parts} &\rightarrow \text{sh. } 1600 \times 3 \\&= \text{sh. 4,800}\end{aligned}$$

Total expenditure

$$\begin{aligned}&\text{sh. } 10,500 \\&\text{sh. } 4,800 \\+ \text{ sh. } 3,000 \\ \hline \text{sh. } 18,300\end{aligned}$$

He pays sh. 18,300

Alternatively

$$\frac{1}{2} \text{ kg} \rightarrow \text{sh. } 1600$$

$$\frac{1}{2} \text{ kg} \rightarrow \text{sh. } 1600$$

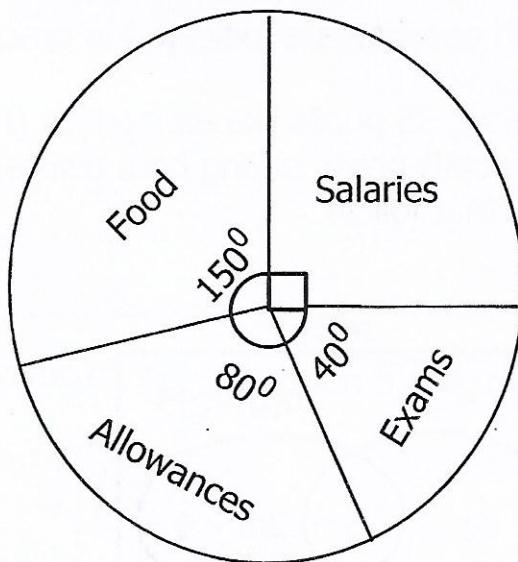
$$\frac{1}{2} \text{ kg} \rightarrow \text{sh. } 1600$$

$$\frac{3}{2} \text{ kg} \rightarrow \text{sh. } 4,800$$

Total expenditure

$$\begin{aligned}\text{sh. } (10,500 + 4,800 + 3,000) \\= \text{sh. } 18,300\end{aligned}$$

18. The circle graph below shows how the head teacher of Patriid P/S planned for second term's expenses.



If the head teacher spent 12 million shillings on paying salaries that term, how much was the total budget for the school?

$$\text{Sh. } 12,000,000 \div \frac{360}{4}$$

$$\text{Sh. } 12,000,000 \times \frac{1}{4}$$

$$\text{Sh. } 12,000,000 \times 4$$

$$= \underline{\text{Sh. } 48,000,000}$$

19. Amos is twice as old as Yudayah. If their total age is 24 years. How old is Yudayah?

Let Yudayah's age be  $y$

Yudayah	Amos	Total
$y$	$2y$	24

$$\begin{aligned} y + 2y &= 24 \\ 3y &= 24 \\ \frac{3y}{3} &= \frac{24}{3} \\ y &= 8 \end{aligned}$$

$\therefore$  Yudayah is 8 years old.

20. Find the cube root of 1000 in the space below.

$$\sqrt[3]{1000}$$

2	1000
2	500
2	250
5	125
5	25
5	5
	1

$$\sqrt[3]{1000} = 2 \times 5$$

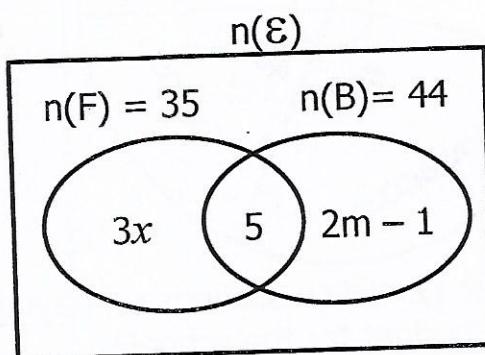
$$= \underline{10}$$

## SECTION B: 60 MARKS

Answer all questions in this section

Marks for each question are indicated in brackets.

21. In the Venn diagram below, 35 pupils like eating Fish (F), 44 pupils like eating Beans (B) and 5 pupils prefer eating both dishes. Study it and use it to answer the questions that follow.



- (a) How many pupils like eating fish only? (02 Marks)

$$3x + 5 = 35$$

$$3x + 5 - 5 = 35 - 5$$

$$3x = 30$$

Since fish only is  $3x$

$$\therefore \text{fish only} = 30 \text{ pupils}$$

Alternatively

$$3x + 5 = 35$$

$$3x + 5 - 5 = 35 - 5$$

$$3x = 30$$

$$\frac{3x}{3} = \frac{30}{3}$$

$$x = 10$$

Fish only

$$3x$$

$$3 \times 10$$

30 pupils

- (b) Find the probability of picking a pupil who likes eating beans only to lead others in prayer. (03 Marks)

Beans only

$$2m - 1$$

Value of m

$$5 + 2m - 1 = 44$$

$$5 - 1 + 2m = 44$$

$$4 - 4 + 2m = 44 - 4$$

$$2m = 40$$

$$\frac{2m}{2} = \frac{40}{2}$$

$$m = 20$$

$$(2m - 1)$$

$$(2 \times 20) - 1$$

$$40 - 1$$

39 pupils

Total no. of pupils

$$44 + 3x$$

$$44 + 30$$

74 pupils

$$\text{Probability} = \frac{n(E)}{n(\text{SS})}$$

$$= \frac{39}{74}$$

22. (a) Solve for  $x$  in,  $\frac{2x+2}{3} = \frac{x+3}{2}$  (02 Marks)

$$\frac{2x+2}{3} = \frac{x+3}{2}$$

$$2(2x+2) = 3(x+3)$$

$$4x+4 = 3x+9$$

$$4x-3x = 9-4$$

$$x = 5$$

Alternatively

LCD of 3 and 2 is 6

$$\frac{2}{3}(2x+2) = \frac{3}{2}(x+3)$$

$$2(2x+2) = 3(x+3)$$

$$4x+4 = 3x+9$$

$$4x-3x = 9-4$$

$$x = 5$$

(b) What is the value of  $\frac{bc-d}{c^2}$  when  $b=8$ ,  $c=3$  and  $d=6$ ? (02 Marks)

$$\begin{array}{r} \frac{bc-d}{c^2} \\ \hline (b \times c) - d \\ c \times c \\ (8 \times 3) - 6 \\ 3 \times 3 \\ \hline = 2 \end{array}$$

$$\begin{array}{r} 24 - 6 \\ \hline 9 \end{array}$$

$$\begin{array}{r} + 82 \\ \hline 91 \end{array}$$

23. The diameter of a wheel of a bicycle is 35cm: the bicycle covers 33 km.

(a) Find the number of revolutions the wheel makes to cover that distance.  $\text{Km m d cm}$  (Use  $\pi$  as  $\frac{22}{7}$ ) (03 Marks)

Distance to cm

$$1\text{km} = 100,000\text{cm}$$

$$33\text{km} = (33 \times 100,000)\text{cm}$$

$$= 3,300,000\text{cm}$$

Circumference

$$C = \pi D$$

$$C = \frac{22}{7} \times \frac{5}{2} \times 35\text{cm}$$

$$= 22 \times 5\text{cm}$$

$$= 110\text{cm}$$

No. of revolutions

Distance

Circumference

$$\frac{3,300,000}{110}\text{cm}$$

$$100\text{cm}$$

30000 revolutions

(b) If the bicycle covers 110 metres per minute, in how many hours will it cover the 33km? (02 Marks)

Change distance to metres

$$1\text{km} = 1000\text{m}$$

$$33\text{km} = (33 \times 1000)\text{m}$$

$$= 33000\text{m}$$

$$110\text{m} \rightarrow 1\text{ minute}$$

$$33000\text{m} \rightarrow \frac{33000}{110}\text{m}$$

$$= 300\text{minutes}$$

Change minutes to hours

$$60\text{mins} = 1\text{hour}$$

$$300\text{mins} = \left(\frac{300}{60}\right)\text{hr}$$

$$= 5\text{hrs.}$$

∴ It will cover 33km in 5 hours

24. (a) Express 36km/hr as metres per second.

(02 Marks)

$$1 \text{ km} = 1000 \text{ m}$$

$$\begin{aligned} 36 \text{ km} &= (36 \times 1000) \text{ m} \\ &= 36000 \text{ m} \end{aligned}$$

$$1 \text{ hr} = 3600 \text{ s}$$

$$\begin{aligned} \text{Speed} &= \frac{\text{Distance}}{\text{Time}} \\ &= \frac{36000 \text{ m}}{3600 \text{ s}} \\ &= 10 \text{ m/s} \end{aligned}$$

- (b) A car driver covered a distance of 100 km at a steady speed of 50 km/hr and a lorry driver covered the same distance but took half an hour more than the car driver. How many minutes did the lorry driver take to cover the distance? (03 Marks)

Time for car driver

$$T = \frac{D}{S}$$

$$T = \frac{100 \text{ km}}{50 \text{ km/hr}}$$

$$T = 2 \text{ hr}$$

Time for Lorry driver

$$T = (2 \text{ hr} + \frac{1}{2} \text{ hr})$$

$$= 2\frac{1}{2} \text{ hrs}$$

Time to minutes

$$1 \text{ hr} = 60 \text{ min}$$

$$\frac{5}{2} \text{ hr} = \left( \frac{5}{2} \times 60 \right) \text{ min}$$

$$= 150 \text{ minutes}$$

25. Kamoga is an Estates Manager who buys and sells houses. He sold two houses, one at sh.33,000,000 making a profit of 10% and the other house at sh.60,000,000 making a profit of 20%. How much had Kamoga paid for the two houses? (04 Marks)

Buying price for 1<sup>st</sup> house

$$100\% + 10\% = 110\%$$

$$\text{Sh. } 33,000,000 \div \frac{110}{100}$$

$$\begin{aligned} \text{Sh. } 33,000,000 &\times \frac{100}{110} \\ &= \text{Sh. } 30,000,000 \end{aligned}$$

$$\text{Sh. } 30,000,000 \times 100$$

$$\underline{\text{Sh. } 3,000,000}$$

Buying price for 2<sup>nd</sup> house

$$100\% + 20\% = 120\%$$

$$\text{Sh. } 60,000,000 \div \frac{120}{100}$$

$$\text{Sh. } 60,000,000 \times \frac{100}{120}$$

$$\text{Sh. } 5,000,000 \times 10$$

$$\underline{\text{Sh. } 50,000,000}$$

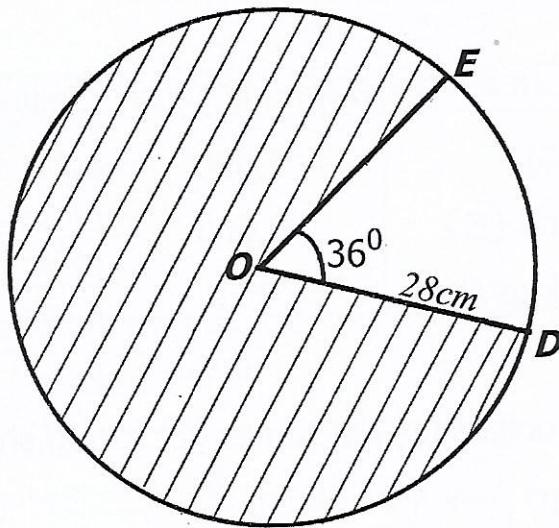
Amount he paid for the 2 houses

$$\text{Sh. } 30,000,000$$

$$+ \text{sh. } 50,000,000$$

$$\underline{\text{Sh. } 80,000,000}$$

26. The diagram below shows sector  $EOD$  of  $36^\circ$  in a circle with radius 28cm. Parts of the circle are shaded. Study and use it to answer the questions below.



(a) Calculate the area of the circle. (Use  $\pi$  as  $\frac{22}{7}$ ) (02 Marks)

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

$$\text{Area} = \frac{22}{7} \times 28^2 \times 28 \text{ cm}^2$$

$$\text{Area} = (22 \times 4) \times 28 \text{ cm}^2$$

$$\text{Area} = 88 \times 28 \text{ cm}^2$$

$$\text{Area} = \underline{\underline{2464 \text{ cm}^2}}$$

(b) Find the area of the shaded part. (03 Marks)

$$\text{Area of shaded part} = \text{Area of the circle} - \text{Area of the sector.}$$

Area of the circle

$$2464 \text{ cm}^2$$

Area of the sector

$$A = \frac{\theta}{360^\circ} \times \pi r^2$$

$$A = \frac{36}{360} \times 2464 \text{ cm}^2$$

$$= \frac{1}{10} \times 2464 \text{ cm}^2$$

$$= \frac{246.4}{10} \text{ cm}^2$$

$$= \underline{\underline{246.4 \text{ cm}^2}}$$

Area of shaded part

$$\begin{aligned} & 2464 \text{ cm}^2 \\ & - 246.4 \text{ cm}^2 \\ \hline & 2217.6 \text{ cm}^2 \end{aligned}$$

Alternatively:

$$x \cancel{=} 36^\circ$$

$$x = 360^\circ - 36^\circ$$

$$x = 324^\circ$$

$$\text{Area} = \frac{\theta}{360^\circ} \pi r^2$$

$$A = \frac{324^\circ}{360^\circ} \times 2464 \text{ cm}^2$$

$$A = \frac{9}{10} \times 2464 \text{ cm}^2$$

$$A = \frac{22,176}{10} \text{ cm}^2$$

$$\text{Area} = \underline{\underline{2217.6 \text{ cm}^2}}$$

27. The table below shows the rate at which different currencies were bought and sold in a commercial bank during the month of June in 2003. Use it to answer the questions that follow.

Currency	Buying in Ug.sh	Selling in Ug.sh
1 US dollar (\$)	1,800	1,820
1 British pound (£)	3,600	3,650
1 Kenya shillings (Ksh)	25.0	27.0

- (a) How many US dollars (\$) did James get for Ug.sh 254,800 by then?

Ugsh. 1,820 → 1 US dollar

$$\text{Ugsh. } 254,800 \rightarrow \frac{12740}{1820} = 140$$

$$140 \\ -091 \\ \hline 364 \\ -364 \\ \hline 0$$

= 140 US dollars

$$14 \\ 91 \overline{) 12740} \\ -81 \\ \hline 46 \\ -46 \\ \hline 0$$

- (b) Kenyatta came from Kenya with Ksh.17,520,000 and exchanged it for British sterling Pounds (£). How many pounds did he get from the bank? (03 Marks)

Ksh. 1  $\xrightarrow{\text{Buy}}$  Ugsh  $\xrightarrow{\text{Sell}}$  Pounds

Kenyashillings to Ugsh

Ksh 1 → Ugsh 25

Ksh. 17,520,000 → 17,520,000 × 25

= Ugsh 438,000,000

Ugsh to British pounds

Ugsh. 3650 → 1 pound

$$\text{Ugsh. } 438,000,000 \rightarrow \frac{120000}{3650} = 120,000$$

= 120,000 pounds

28. Three girls, Nankya, Nandu and Nambi shared a certain amount of money. Nankya got sh.60,000, Nandu got sh.90,000 and Nambi got 40% of the shared money.

(a) How much money was shared by the three girls altogether?

(03 Marks)

Nankya + Nandu

$$\begin{array}{r} \text{Sh. } 90,000 \\ + \text{Sh. } 60,000 \\ \hline \text{Sh. } 150,000 \end{array}$$

%age of Nankya + Nandu

$$100\% - 40\% = 60\%$$

Total amount shared

$$\text{Sh. } 150,000 \div \frac{60}{100}$$

$$\text{Sh. } 150,000 \times \frac{\frac{5}{100}}{60}$$

$$\text{Sh. } 50,000 \times \frac{5}{60}$$

$$= \text{Sh. } 250,000$$

(b) How much did Nambi get?

(01 Mark)

$$\frac{40}{100} \times \text{sh. } 250,000$$

$$4 \times \text{sh. } 250,000$$

$$= \underline{\underline{\text{sh. } 100,000}}$$

Alternatively:

$$\begin{array}{r} \text{Sh. } 250,000 \\ - \text{Sh. } 150,000 \\ \hline \text{Sh. } 100,000 \end{array}$$

(c) What percentage of the total amount shared did Nankya get?

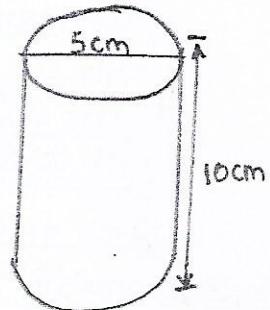
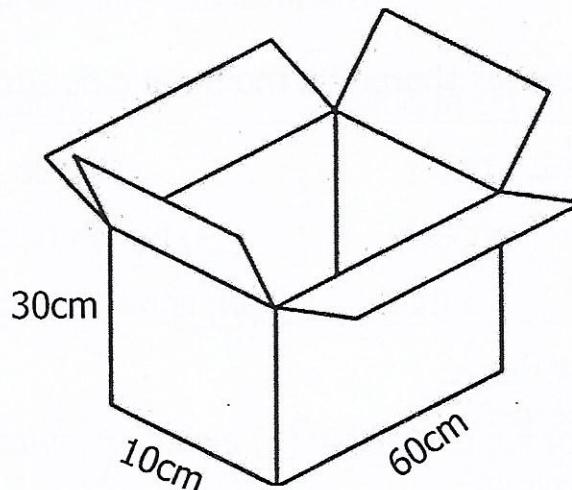
(02 Marks)

$$\left( \frac{\text{Sh. } 60,000}{\text{Sh. } 250,000} \times \frac{4}{100} \right) \%$$

$$6 \times 4$$

$$= \underline{\underline{24\%}}$$

29. Kolonyi packed cylindrical tins of height 10cm and diameter of 5cm in a rectangular box below. Use it to answer the questions that follow.



(a) How many tins will be packed in the box?

(02 Marks)

No. of tins

$$\frac{L}{D} \times \frac{W}{D} \times \frac{H}{D}$$

$$\frac{60\text{cm}}{5\text{cm}} \times \frac{10\text{cm}}{5\text{cm}} \times \frac{30\text{cm}}{10\text{cm}}$$

$$(12 \times 2) \times 3$$

$$24 \times 3$$

$$= 72 \text{ tins}$$

(b) Find the space (in  $\text{cm}^3$ ) that will remain after packing the tins in the box.  
(Use  $\pi$  as 3.14)

Space left = Volume of the box - Volume of the tins.

(03 Marks)

Volume of the box

$$L \times W \times H$$

$$60\text{cm} \times 10\text{cm} \times 30\text{cm}$$

$$6000\text{cm} \times 30\text{cm}$$

$$18000\text{cm}^3$$

Volume of the tins

$$\pi r^2 \times 72 \text{ tins}$$

$$\frac{3.14}{100} \times \frac{25\text{cm}}{2} \times \frac{25\text{cm}}{2} \times 10\text{cm} \times 72$$

$$157 \times 25\text{cm}^2 \times 36\text{cm}$$

$$10$$

$$14130\text{cm}^3$$

$$10$$

$$= 14130\text{cm}^3$$

Space left

$$18000\text{cm}^3$$

$$- 14130\text{cm}^3$$

$$3870\text{cm}^3$$

30. Frank spent  $\frac{1}{4}$  of his salary on food,  $\frac{1}{12}$  on clothing and lent sh.300,000 to Olinde at an interest rate of 5% per year for 4 months.

(a) How much does Frank get as salary?

(03 Marks)

Food	Clothing	Loan	Tot
$\frac{1}{4}$	$\frac{1}{12}$	$\frac{2}{3}$	1
Sh.300,000			

Fraction for Loan

$$\begin{aligned} \frac{1}{4} + \frac{1}{12} & \quad \text{LCD} = 12 \\ \frac{3+1}{12} & \\ \frac{4}{12} & \end{aligned}$$

$$\begin{aligned} \frac{12}{12} - \frac{4}{12} & \\ \underline{-8} & \\ \underline{2} & \\ +23 & \\ \underline{\underline{2}} & \\ \underline{\underline{3}} & \end{aligned}$$

Salary

$$\text{sh. } 300,000 \div \frac{2}{3}$$

$$\text{sh. } 300,000 \times \frac{3}{2}$$

$$\text{sh. } 150,000 \times 3$$

$$= \text{sh. } 450,000$$

(b) How much money altogether did Olinde pay back? (03 Marks)

$$A = P + I$$

$$I = P \times R \times T$$

$$I = \text{sh. } 300,000 \times \frac{10}{100} \times \frac{5}{128}$$

$$I = \text{sh. } 1000 \times 5$$

$$I = \text{sh. } 5,000$$

Amount paid back

$$P + I$$

$$\text{sh. } 300,000$$

$$+ \text{sh. } 5,000$$

$$\text{sh. } 305,000$$

31. In a quiz contest, 5 marks were awarded for any correct response and 2 marks deducted for any wrong response given by a contestant. How many correct responses were given by a contestant who scored 72 marks from the 20 questions that were asked by the panel? (04 Marks)

Let the correct responses be  $c$ .

Correct	Wrong	Total
$c$	$20 - c$	20
$c \times 5$	$-2(20-c)$	70

$$5c - 2(20 - c) = 72$$

$$5c - 40 + 2c = 72$$

$$5c + 2c - 40 = 72$$

$$7c - 40 = 72$$

$$7c - 40 + 40 = 72 + 40$$

$$7c = 112$$

$$\frac{7c}{7} = \frac{112}{7}$$

$$c = 16$$

$\therefore$  He gave 16  
correct responses

Alternatively

Total marks

$$20 \times 5 = 100 \text{ marks}$$

Lost marks

$$100 - 72 = 28 \text{ marks}$$

for every wrong response,  
the contestant loses

$$5 + 2 = 7 \text{ marks}$$

Wrong responses

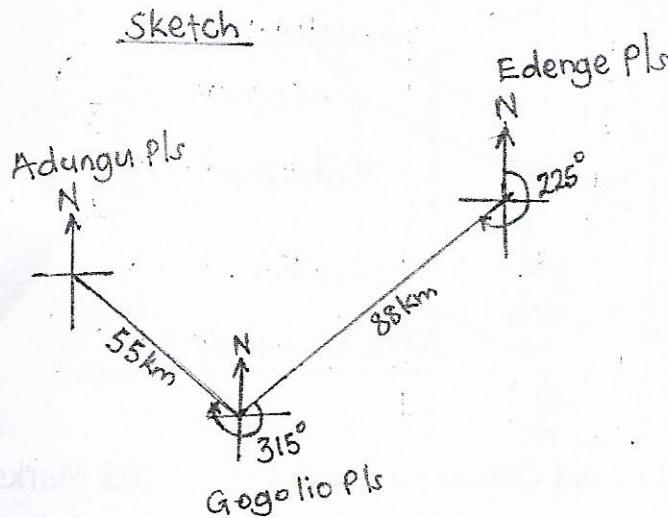
$$28 \div 7 = 4$$

correct responses

$$20 - 4 = 16 \quad 15 | \text{Page}$$

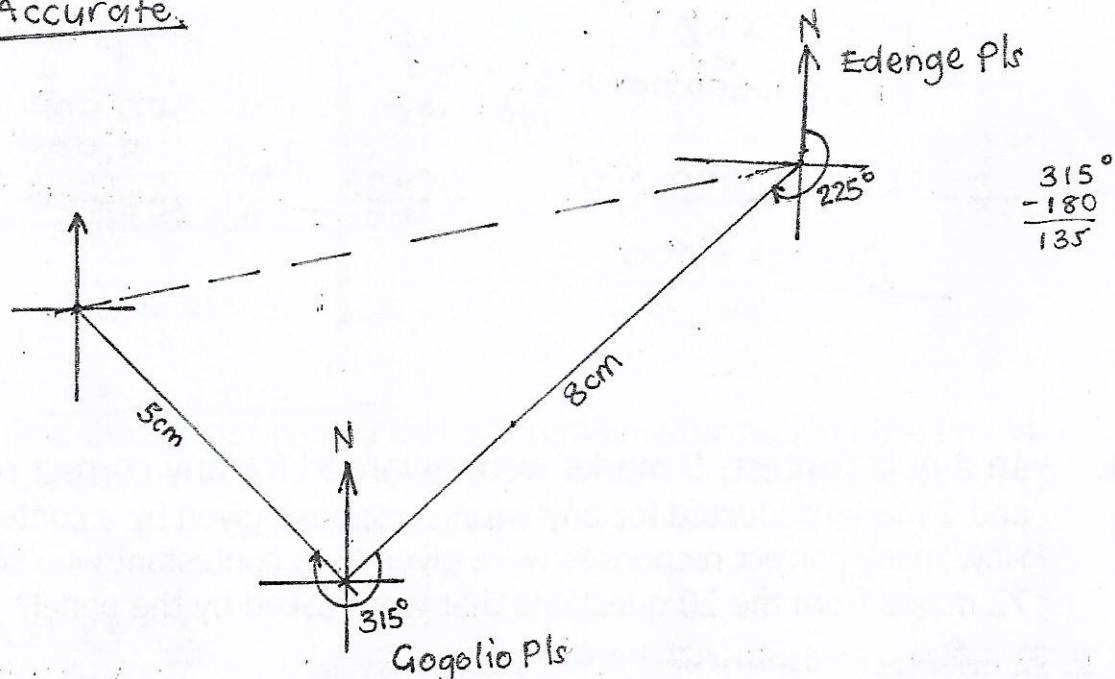
32. Gogolio P/S is on a bearing of  $225^\circ$ , 88km away from Edenge P/S. From there, you will find Adungu P/S which is 55km away on a bearing of  $315^\circ$ .

- (a) Using a scale of 1cm to represent 11km, draw an accurate diagram to show the positions of the three schools. (04 Marks)



11 Km	→ 1cm
88 Km	→ $\frac{88}{11}$
8 cm	
11 Km	→ 1cm
55 Km	→ $\frac{55}{11}$
5 cm	

Accurate:



- (b) What is the bearing of Edenge P/S from Adungu P/S? (01 Mark)

079° | 080° | 081°

$90^\circ - 10^\circ = 80^\circ$

- (c) Workout the shortest distance from Adungu P/S to Edenge P/S in Km. (01 Mark)

9.5cm | 9.6cm | 9.7cm

$$9.5 \times 11 \text{ km}$$

$$\frac{95}{10} \times 11$$

$$\frac{104.5}{10} \approx 104.5 \text{ km}$$

$$9.6 \times 11 \text{ km}$$

$$\frac{96}{10} \times 11$$

$$\frac{105.6}{10} = 105.6 \text{ km}$$

$$9.7 \times 11 \text{ km}$$

$$\frac{97}{10} \times 11$$

$$\frac{106.7}{10} = 106.7 \text{ km}$$

**END**