

PLE 2024 MTC GUIDE



UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2024

MATHEMATICS

Time Allowed: 2 hours 30 minutes

Random No.						Personal No.		

Candidate's Name:

Candidate's Signature:

District ID No.

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Read the following instructions carefully:

1. Do not write your **school** or **district name** anywhere on this paper.
2. This paper has **two** sections: **A** and **B**.
Section **A** has **20** questions and section **B** has **12** questions. The paper has **15 printed pages**.
3. Answer **all** the questions. **All** the working for both sections **A** and **B** must be shown in the spaces provided.
4. **All** the working **must** be done using a **blue** or **black** ball point pen or ink. Any work done in pencil other than graphs and diagrams will **not** be marked.
5. **No calculators** are allowed in the examination room.
6. Unnecessary **changes** in your work and handwriting that cannot be read easily may lead to **loss of marks**.
7. Do not fill anything in the table indicated **"FOR EXAMINERS' USE ONLY"** and in the boxes inside the question paper.

FOR EXAMINERS' USE ONLY		
QN NO.	MARKS	EXR'S NO.
1 - 5		
6 - 10		
11 - 15		
16 - 20		
21 - 22		
23 - 24		
25 - 26		
27 - 28		
29 - 30		
31 - 32		
TOTAL		

SECTION A: 40 MARKS

Answer **all** the questions in this section.
Questions **1** to **20** carry two marks each.

1. Work out:

$$\begin{array}{r} 1 \\ 3 \ 5 \\ \times \ 3 \\ \hline 10 \ 5 \end{array}$$

$$5 \times 3 = 15$$

$$3 \times 3 = 9$$

$$9 + 1 = 10$$

2. Write CXIV in Hindu Arabic numerals.

$$\begin{array}{ccc} C & X & IV \\ 100 & + & 10 & + & 4 \\ \hline 114 \end{array}$$

$$\begin{array}{r} 100 \\ 10 \\ + \ 4 \\ \hline 114 \end{array}$$

3. Given that $M = \{b, a, t\}$, write down all the subsets of set M.

$\{ \}$, $\{b\}$, $\{a\}$, $\{t\}$,

$\{b, a\}$, $\{b, t\}$, $\{a, t\}$, $\{b, a, t\}$

4. Find a fraction equivalent to $\frac{4}{7}$.

$$\frac{4}{7} \times \frac{2}{2}$$

$$\frac{8}{14}$$

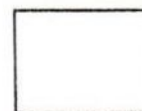
5. Expand 3405 using powers of ten.

Th	H	T	O
3	4	0	5

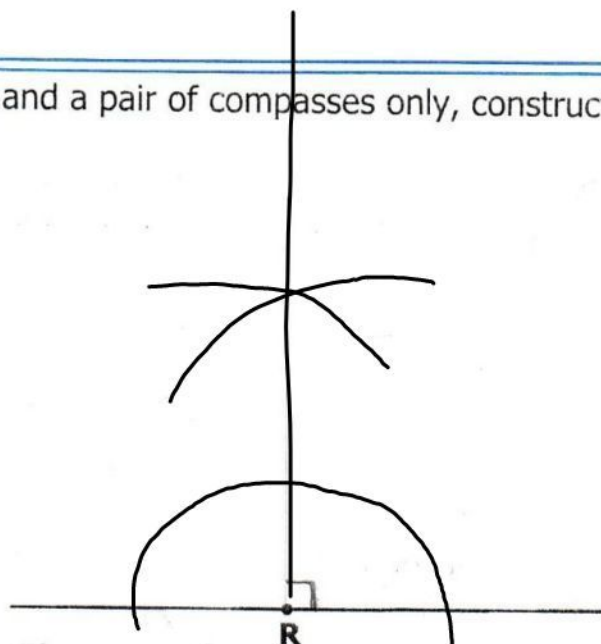
$$(3 \times 1000) + (4 \times 100) + (0 \times 10) + (5 \times 1)$$

$$(3 \times 10 \times 10 \times 10) + (4 \times 10 \times 10) + (0 \times 10) + (5 \times 1)$$

$$(3 \times 10^3) + (4 \times 10^2) + (0 \times 10^1) + (5 \times 10^0)$$



6. Using a ruler and a pair of compasses only, construct a right angle at point **R**.



7. Given that $a = 3$, $b = 1$ and $n = 2$, find the value of $2a^n b$.

$$2 \times a^n \times b$$

$$2 \times 3^2 \times 1$$

$$2 \times 3 \times 3 \times 1$$

$$18$$

8. Find the next number in the sequence:

2, 3, 6, 11, 18, 27, ...

+1 +3 +5 +7 +9

$$\begin{array}{r} 18 \\ + 9 \\ \hline 27 \end{array}$$

9. It takes Ankunda 35 minutes to walk from school to home. If she arrived home at 12:20 p.m, what time did she leave school?

$$\text{Ending time} = \text{ST} + \text{Duration}$$

$$\text{Starting time} = \text{Ending time} - \text{Duration}$$

Hrs	Min
11	80
+2	20+60
-00	35
<hr/>	<hr/>
11	45

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

She left school at 11:45 a.m.

10. Otunu sold a goat and made a profit of sh 18,000. The cost price of the goat was sh 90,000. Calculate Otunu's percentage profit.

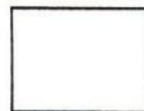
$$\left(\frac{\text{Profit}}{\text{Cost price}} \times 100 \right) \%$$

20%

$$\left(\frac{\text{Sh. } 18,000}{\text{Sh. } 90,000} \times 100 \right) \%$$

His percentage profit was 20%

$$\left(\frac{\text{Sh. } 18,000}{\text{Sh. } 90,000} \times 100 \right) \%$$



11. Find the largest number that divides both 24 and 18 without a remainder.

Factors of 24

$$24 \div 1 = 24$$

$$24 \div 24 = 1$$

$$24 \div 2 = 12$$

$$24 \div 12 = 2$$

$$24 \div 3 = 8$$

$$24 \div 8 = 3$$

$$24 \div 6 = 4$$

$$24 \div 4 = 6$$

$$F_{24} = \{1, 2, 3, 4, 6, 8, 12, 24\}$$

Factors of 18

$$18 \div 1 = 18$$

$$18 \div 18 = 1$$

$$18 \div 2 = 9$$

$$18 \div 9 = 2$$

$$18 \div 3 = 6$$

$$18 \div 6 = 3$$

$$F_{18} = \{1, 2, 3, 6, 9, 18\}$$

$$CF = \{1, 2, 3, 6\}$$

$$GCF = 6$$

The largest number is 6.

12. Work out: $42 - 21 \div 3$

$$42 - (21 \div 3)$$

$$42 - 7$$

$$35$$

$$\begin{array}{r} 3 \\ 4 \overline{) 12} \\ - 7 \\ \hline 35 \end{array}$$

13. The range of a set of scores is 23. The highest score is 76. Find the lowest score.

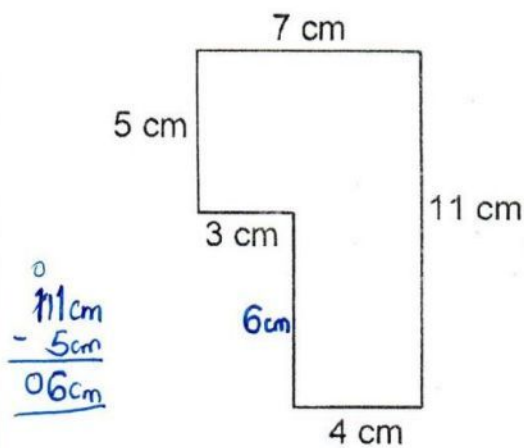
$$\text{Range} = \text{Highest score} - \text{Lowest score}$$

$$\text{Lowest score} = \text{Highest score} - \text{Range}$$

$$\begin{array}{r} 76 \\ - 23 \\ \hline 53 \end{array}$$

The lowest score is 53

14. Find the perimeter of the figure below.



$$\begin{array}{r} 11\text{cm} \\ - 5\text{cm} \\ \hline 06\text{cm} \end{array}$$

Perimeter.

$$11\text{cm} + 7\text{cm} + 5\text{cm} + 3\text{cm} + 6\text{cm} + 4\text{cm}$$

$$18\text{cm} + 8\text{cm} + 10\text{cm}$$

$$18\text{cm} + 18\text{cm}$$

$$36\text{cm}$$

$$\begin{array}{r} 18 \\ + 18 \\ \hline 36 \end{array}$$

15. A school cook requires 24 kg of maize flour to feed 120 pupils. Find in grammes, the amount of maize flour the cook would require to feed 3 pupils.

24 kg to grammes.

$$1\text{kg} = 1000\text{grammes}$$

$$24\text{kg} = 24 \times 1000\text{gm}$$

$$24\text{kg} = 24000\text{gm}$$

120 pupils take 24000 gm

$$1\text{pupil takes } \frac{24000\text{gm}}{120}$$

1 pupil takes 200 gm

3 pupils take $3 \times 200\text{gm}$

3 pupils take 600 grammes

The cook would require 600 grammes to feed 3 pupils.



16. Akiiki bought a suit at Kenya shillings (Ksh) 11,500. If the exchange rate was 1 Ksh = Ug.sh 32, how much money would Akiiki have paid for the suit in Uganda shillings (Ug.sh)?

$$1 \text{ ksh} = \text{Ug.sh } 32$$

$$11,500 \text{ ksh} = \text{Ug.sh } 32 \times 11,500$$

$$11,500 \text{ ksh} = \text{Ug.sh } 368,000$$

Akiiki would have paid Ug.sh 368,000

17. Solve: $3 - 2y < 9$

$$3 - 2y < 9$$

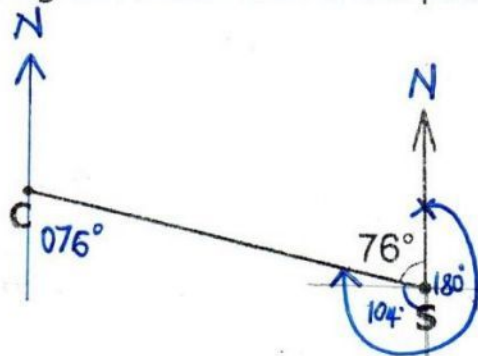
$$3 - 3 - 2y < 9 - 3$$

$$-2y < 6$$

$$\frac{-2y}{-2} > \frac{6}{-2}$$

$$y > -3$$

18. The diagram below shows the position of a church (C) from a school (S).



$$\begin{array}{r} 180^\circ \\ - 76^\circ \\ \hline 104^\circ \end{array}$$

Find the bearing of the church from the school.

$$\begin{array}{r} 180^\circ \\ + 104^\circ \\ \hline 284^\circ \end{array}$$

The bearing of the church from the school is 284°

19. If today is Monday and a cake baked today can expire after 16 days, what day of the week will the cake expire?

Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	2	3	4	5	6	0

3 represents Wednesday.

$$1 + 16 = _ \pmod{7}$$

$$17 = _ \pmod{7}$$

$$17 \div 7 = 2 \text{ rem } 3$$

$$17 = 3 \pmod{7}$$

$$1 + 16 = 3 \pmod{7}$$

It will expire on Wednesday.

20. One morning, the temperature on top of a mountain was -3°C . The temperature rose by 8°C in the afternoon. Find the afternoon temperature.

$$-3^{\circ}\text{C} + 8^{\circ}\text{C}$$

$$5^{\circ}\text{C}$$

+	+	+	+	+	+	+	+	+	+
-	-	-							

The afternoon temperature will be 5°C .



SECTION B: 60 MARKS

Answer **all** the questions in this section.
Marks for each question are indicated in the brackets.

21. Work out:

$$\frac{2.92 - 2.36}{0.068 + 0.012}$$

$$\begin{array}{r} 2.912 \\ - 2.36 \\ \hline 0.56 \end{array}$$

$$\begin{array}{r} 0.068 \\ + 0.012 \\ \hline 0.080 \\ \hline 0.08 \end{array}$$

$$\frac{0.56}{0.08}$$

$$\frac{56}{100} \div \frac{8}{100}$$

$$\frac{56}{100} \times \frac{100}{8}$$

(04 marks)

$$\frac{56}{100} \times \frac{100}{8}$$

7

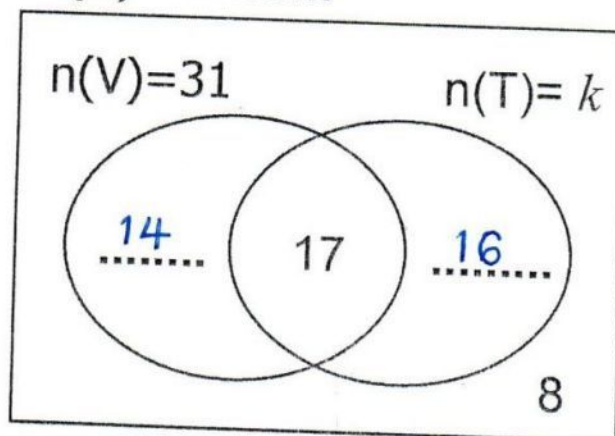
22. In a class, 31 pupils like volleyball (V) and k pupils like table tennis (T). 17 pupils like both games while 8 pupils do not like any of the two games. The number of pupils who like table tennis only is twice the number of those who do not like any of the two games.

(a) Use the given information to complete the Venn diagram below.
(04 marks)

$$n(\mathcal{E}) = \dots 55 \dots$$

Volleyball
only

$$\begin{array}{r} 2 \\ 31 \\ - 17 \\ \hline 14 \end{array}$$



Tennis only

$$\begin{array}{r} 8 \times 2 \\ 16 \end{array}$$

$$n(\mathcal{E}) = 14 + 17 + 16 + 8$$

$$n(\mathcal{E}) = 55$$

$$\begin{array}{r} 14 \\ 17 \\ 16 \\ + 8 \\ \hline 55 \end{array}$$

(b) Find;

(i) the value of k .

(01 mark)

$$K = 17 + 16$$

$$K = 33$$

(ii) the probability that a pupil picked at random from the class likes both volleyball and table tennis.

(01 mark)

$$\text{Probability} = \frac{\text{Possible chance}}{\text{Total chances}}$$

$$\text{Probability} = \frac{17}{55}$$



A taxi and a bus were hired to transport people for a function. The taxi transports 14 people when full while the bus transports 69 people when full. The taxi made five trips and the bus made one trip. The taxi and the bus made the trips when full.

(a) Find the total number of people that were transported to the function.

(03 marks)

People carried by
a taxi

$$\begin{array}{r} 14 \\ \times 5 \\ \hline 70 \end{array}$$

70 people.

People carried by
a bus

$$69 \times 1$$

$$69 \times 1$$

69 people

Total people

$$\begin{array}{r} 70 \\ + 69 \\ \hline 139 \end{array}$$

139 people were transported.

(b) The taxi owner was paid sh 56,000 per trip. Calculate the amount of money that was paid for each person.

(02 marks)

14 people paid sh. 56,000

1 person paid sh. $\frac{56,000}{14}$

1 person paid sh. 4,000

$$1 \times 14 = 14$$

$$2 \times 14 = 28$$

$$3 \times 14 = 42$$

$$4 \times 14 = 56$$

$$5 \times 14 = 70$$

24. Given that $202_p = 1221_{\text{three}}$, find the value of p . (04 marks)

$$\begin{array}{c} 202_p \\ \begin{array}{|c|c|c|} \hline \text{Lone} & \text{Lone} & \text{Lone} \\ \hline \end{array} \\ \begin{array}{|c|c|c|} \hline p & p & p \\ \hline \end{array} \\ \hline p \times p \end{array} = \begin{array}{c} 1221_{\text{three}} \\ \begin{array}{|c|c|c|c|} \hline \text{Lone} & \text{three} & \text{three} & \text{three} \\ \hline \end{array} \\ \begin{array}{|c|c|c|c|} \hline \text{three} & \text{three} & \text{three} & \text{three} \\ \hline \end{array} \end{array}$$

$$(2 \times p \times p) + (0 \times p) + (2 \times 1) = (1 \times 3 \times 3 \times 3) + (2 \times 3 \times 3) + (2 \times 3) + (1 \times 1)$$

$$2p^2 + 0 + 2 = 27 + 18 + 6 + 1$$

$$2p^2 + 2 = 52$$

$$2p^2 + 2 - 2 = 52 - 2$$

$$2p^2 = 50$$

$$\frac{2p^2}{2} = \frac{50}{2}$$

$$p^2 = 25$$

$$\sqrt{p^2} = \sqrt{25}$$

$$p = 5$$

p is base five.

$$\begin{array}{r} 5 \overline{) 25} \\ \underline{5} \\ 5 \\ \underline{5} \\ 0 \\ 0 \\ \underline{0} \\ 0 \end{array}$$

25. The table below shows the amount of money Rukia paid for food stuff to a businesswoman after she was given a discount of sh 2,200.

(a) Study and complete the table.

(03 marks)

Item	Quantity	Cost per kg	Amount
Rice	4 kg	sh 3,800	sh 15,200
Beans	6 kg	sh 5,000	sh 30,000
Irish Potatoes	0.5 kg	sh 3,200	sh 1,600
Total			sh 46,800

$$\begin{array}{r} \text{Rice} \\ \text{sh. } 3,800 \\ \times 4 \\ \hline \text{sh. } 15,200 \end{array}$$

$$\begin{array}{r} \text{Beans} \\ \text{sh. } 5,000 \\ \times 6 \\ \hline \text{sh. } 30,000 \end{array}$$

$$\begin{array}{r} \text{Irish potatoes} \\ \text{sh. } 1,600 \div 0.5 \\ \hline \text{sh. } 3,200 \end{array}$$

$$\begin{array}{r} \text{sh. } 1,600 \times \frac{2}{5} \\ \hline \text{sh. } 3,200 \end{array}$$

- (b) Find how much money Rukia would have paid without the discount.

(02 marks)

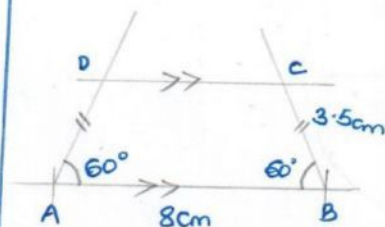
$$\begin{array}{r} \text{sh. } 46,800 \\ + \text{sh. } 2,200 \\ \hline \text{sh. } 49,000 \end{array}$$

Rukia would have paid sh. 49,000

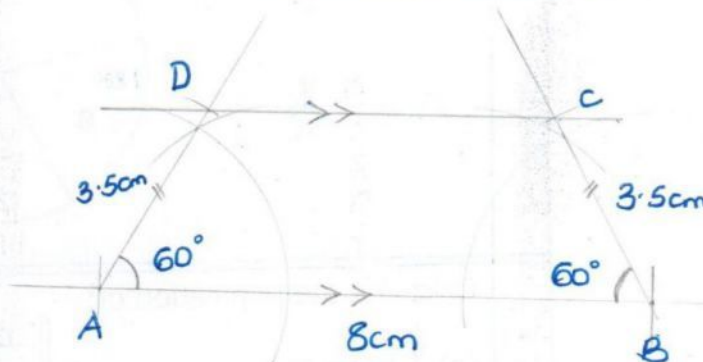


26. (a) Using a ruler and a pair of compasses only, construct a trapezium ABCD in which line AB = 8 cm, angle DAB = angle ABC = 60° and line AD = BC = 3 cm. (04 marks)

Sketch diagram



Accurate shape



- (b) Measure angle ADC.

120°

(01 mark)

27. A motorcycle tyre made 40 complete turns to cover a distance of 5280 cm. Calculate the radius of the tyre. (Use $\pi = \frac{22}{7}$) (04 marks)

5280cm for 40 turns

40 turns for 5280cm

1 turn for 5280cm

1 turn for 528cm

1 turn for 132cm

1 turn = circumference

$C = 132\text{cm}$

$$2\pi r = C$$

$$2 \times \frac{22}{7} r = 132\text{cm}$$

$$\frac{44}{7} r = 132\text{cm}$$

$$\frac{44}{7} r = 132\text{cm} \times \frac{7}{44}$$

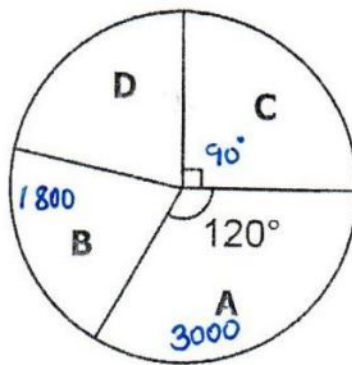
$$r = 3\text{cm} \times 7$$

$$r = 7\text{cm} \times 3$$

$$r = 21\text{cm}$$

The radius of the tyre is 21cm.

28. The pie chart below represents the population of four towns **A**, **B**, **C** and **D**. The population of town **A** is 3000 people and that of town **B** is 1800 people. Study the pie chart and use it to answer the questions that follow.



Calculate the population of;

- (a) town **C**.

120° rep. 3000 people

1° rep. $\frac{3000}{120}$ people

1° rep. $\frac{300}{12}$ People

90° rep. $\frac{30}{90} \times \frac{75}{4}$ People $\frac{75}{4}$
(04 marks)

90° rep. 2250 people.

The population of C is 2250 people.

- (b) town **D**.

Total population

1° rep. $\frac{300}{12}$ people

360° rep. $\frac{360}{360} \times \frac{300}{12}$

360° rep. 9000

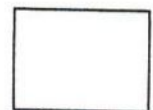
Population for D

$9000 - (3000 + 1800 + 2250)$

$9000 - 7050$

1950 People.

(02 marks)
 $\begin{array}{r} 9000 \\ - 7050 \\ \hline 1950 \end{array}$



29. (a) Solve: $\frac{5t-6}{2} = t+12$

(02 marks)

$$2(5t-6) = (t+12)2$$

$$5t-6 = 2(t+12)$$

$$5t-6 = 2t+24$$

$$5t-2t = 24+6$$

$$3t = 30$$

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

$$t = 10$$

(b) Subtract $(2m - 3)$ from $(5m + 2)$.

(02 marks)

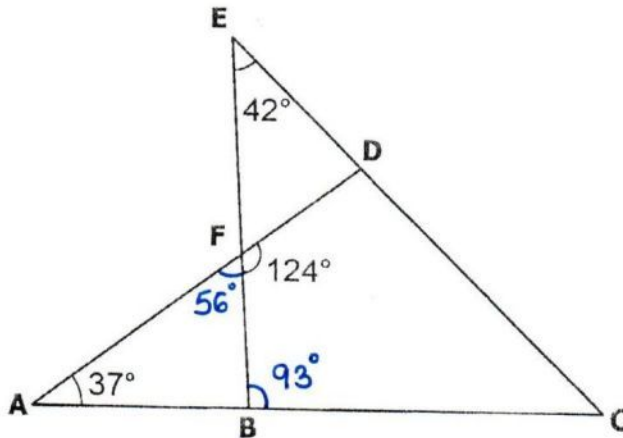
$$(5m + 2) - (2m - 3)$$

$$5m + 2 - 2m + 3$$

$$5m - 2m + 2 + 3$$

$$3m + 5$$

30. In the diagram below, angle $DAC = 37^\circ$, angle $BEC = 42^\circ$ and angle $BFD = 124^\circ$. Study the diagram and answer the questions that follow.



Find the size of;

(a) angle EBC.

(03 marks)

Angle AFB

$$\begin{array}{r} 180^\circ \\ - 124^\circ \\ \hline 56^\circ \end{array}$$

Angle EBC.

$$\begin{array}{r} 56^\circ \\ + 37^\circ \\ \hline 93^\circ \end{array}$$

(b) angle DCA.

(02 marks)

$$DCA + 93^\circ + 42^\circ = 180^\circ$$

$$DCA + 135^\circ = 180^\circ$$

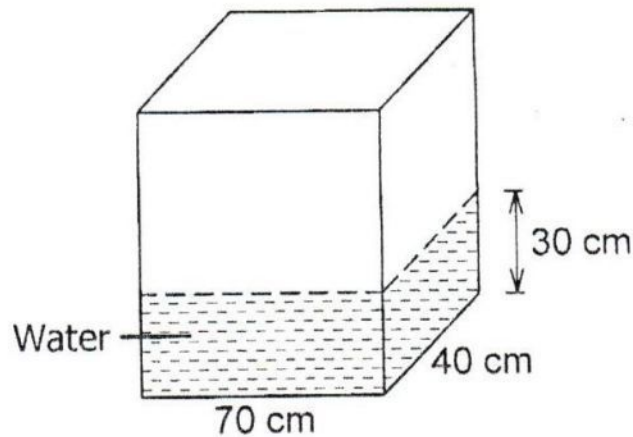
$$DCA + 135^\circ - 135^\circ = 180^\circ - 135^\circ$$

$$DCA = 45^\circ$$

$$\begin{array}{r} 180^\circ \\ - 135^\circ \\ \hline 45^\circ \end{array}$$



31. The diagram below shows a tank with a rectangular base containing some water. Study and use it to answer the questions that follow.



- (a) Calculate the volume of the water in the tank.

(02 marks)

$$\text{Vol} = \text{Base area} \times h$$

$$\text{Vol} = L \times W \times h$$

$$\text{Vol} = 70\text{cm} \times 40\text{cm} \times 30\text{cm}$$

$$\text{Vol} = 84000 \text{ cm}^3$$

$$\begin{array}{r} +2 \\ 28 \\ \times 3 \\ \hline 84 \end{array}$$

- (b) If 28 litres of the water was removed for washing clothes, calculate the height of the water that remained in the tank.

(04 marks)

Volume of water removed in cm^3

$$1 \text{ litre} = 1000 \text{ cm}^3$$

$$28 \text{ litres} = 28 \times 1000 \text{ cm}^3$$

$$28 \text{ litres} = 28000 \text{ cm}^3$$

Volume of water that remained.

$$\begin{array}{r} 84000 \text{ cm}^3 \\ - 28000 \text{ cm}^3 \\ \hline 56000 \text{ cm}^3 \end{array}$$

Height of water that remained

$$L \times W \times h = \text{vol}$$

$$70\text{cm} \times 40\text{cm} \times h = 56000 \text{ cm}^3$$

$$2800 \text{ cm}^2 \times h = 56000 \text{ cm}^3$$

$$\frac{2800 \text{ cm}^2 \times h}{2800 \text{ cm}^2} = \frac{56000 \text{ cm}^3}{2800 \text{ cm}^2}$$

$$h = 20\text{cm}$$

Height of remaining water is 20cm

32. A motorcyclist left home for town at 8:00 a.m. riding at a speed of 40 km/h. After 30 minutes, he got a flat tyre which took him 45 minutes to repair. The distance between the home of the motorcyclist and town is 68 km.

- (a) Find the distance the motorcyclist had covered before he got the flat tyre. *Time in hours.*

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

$$1 \text{ min} = \frac{1}{60} \text{ hours}$$

$$30 \text{ min} = 30 \times \frac{1}{60} \text{ hours}$$

$$30 \text{ min} = \frac{30}{60} \text{ hours}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Distance} = \frac{40 \text{ km}}{1 \text{ h}} \times \frac{30}{60} \quad (02 \text{ marks})$$

$$\text{Distance} = \frac{20}{40} \text{ km} \times \frac{1}{2}$$

$$\text{Distance} = 20 \text{ km}$$

- (b) Calculate the speed at which the motorcyclist had to ride in order to reach town at 10:00 a.m. *(04 marks)*

Remaining distance

$$\begin{array}{r} 68 \text{ km} \\ - 20 \text{ km} \\ \hline 48 \text{ km} \end{array}$$

Duration for the first journey.

$$\begin{array}{r} 30 \text{ min} \\ + 45 \text{ min} \\ \hline 75 \text{ min} \end{array}$$

Duration in hours.

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

$$75 \text{ min} = 75 - 60$$

$$15$$

$$1 \text{ h } 15 \text{ min}$$

Total Duration

$$D = E.T - S.T$$

$$\text{Hrs min}$$

$$10 \quad 00$$

$$- 8 \quad 00$$

$$\hline 2 \quad 00$$

$$2 \text{ hours}$$

Duration for the remaining journey.

$$\text{Hrs min}$$

$$2 \quad 00$$

$$- 1 \quad 15$$

$$\hline 0 \quad 45$$

$$45 \text{ min}$$

Duration in hours

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

$$45 \text{ min} = \frac{45}{60} \text{ h}$$

$$\frac{3}{4} \text{ h}$$

Speed the motorcyclist should use to reach at 10:00 a.m.

$$S = D \div T$$

$$S = 48 \text{ km} \div \frac{3}{4} \text{ h}$$

$$S = \frac{48}{3} \text{ km} \times \frac{4}{1} \text{ h}$$

$$S = 64 \text{ km/h}$$

