

- 4 (a) A woman has 6 green marbles and 8 red marbles in a box. Find the probability of randomly picking a red marble from the box. [2]

- (b) Mafamu land, which is valued at K80 000.00, appreciates by straight line method at 10% per year. What is its book value after 2 years? [3]

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- (c) (i) Use geometrical instruments to construct triangle DEF in which  $DE = 8\text{cm}$ , angle  $DEF = 60^\circ$  and angle  $EDF = 70^\circ$ . [1]
- (ii) Bisect angle EDF and angle DEF and let the angle bisectors meet at O. [2]
- (iii) Draw a perpendicular from O to the side DE. Label the point where the perpendicular meets DE as G. [1]
- (iv) With centre O, draw a circle which touches the three sides of triangle DEF. [1]

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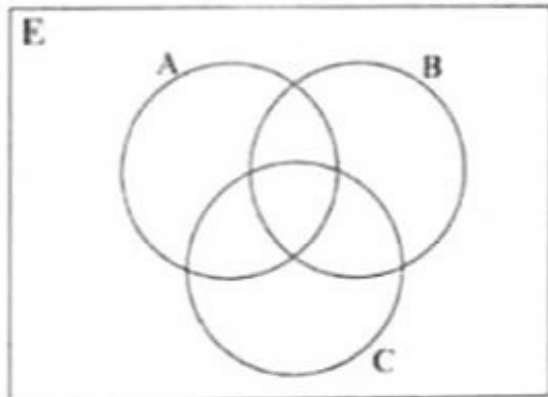
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- 5 (a) Given that  $E = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{2, 3, 4, 5\}$ ,  
 $B = \{0, 2, 4, 6, 8, 10\}$  and  $C = \{\text{factors of } 10\}$ ,

- (i) illustrate this information in the Venn diagram below. [2]

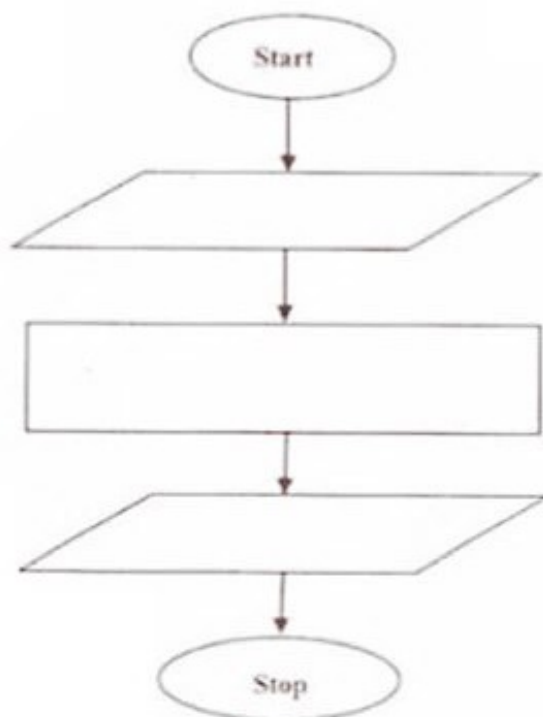


- (ii) list the set  $(A \cup B) \cap C'$ . [2]

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- (b) The exchange rate between the American dollar and the Zambian Kwacha was \$1 = K9.96 on a particular day. How many dollars could be exchanged for K19 920.00? [3]

- (c) Given the distance ( $D$ ) covered by a car and the time ( $T$ ) the car takes to cover this distance, complete the flow chart below for calculating and displaying its average speed ( $S$ ).



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[3]

6 (a) Evaluate  $133_{\text{five}} \times 43_{\text{five}}$ , giving your answer in base five. [3]

(b) A stove costs K3 000.00 exclusive of Value Added Tax (VAT). Calculate the cost of the stove if 16% VAT is included. [3]

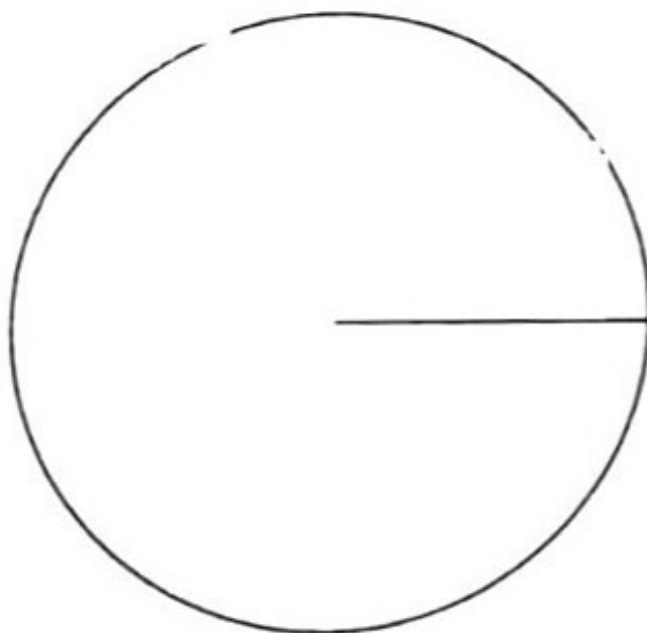
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- (c) The table below shows the quantity of fuel sold by a filling station on a particular day.

Type of fuel	Petrol	Diesel	Kerosene
Number of litres sold	6 000	4 000	2 000

Illustrate this information on the pie chart below.

[4]



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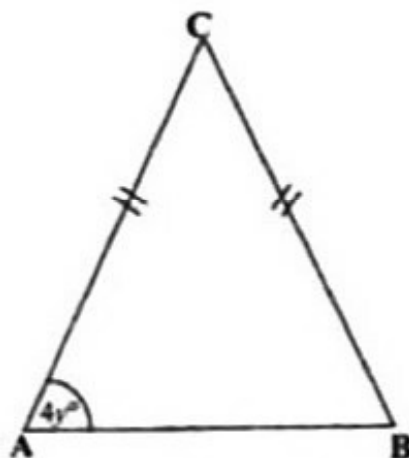
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[Turn over

7 (a) Simplify  $12 - 6x - 4(5 - 3x)$ .

[2]

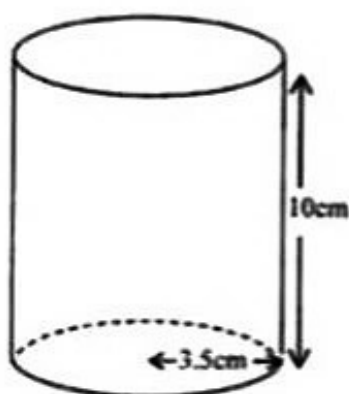
(b) In triangle ABC below,  $AC = BC$  and angle  $BAC = 4y^\circ$ .



Express the size of angle ACB in terms of  $y$  in its simplest form. [2]

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- (c) A tomato sauce container is in the form of a cylinder of base radius 3.5cm and height 10cm. [Take  $\pi$  as  $\frac{22}{7}$ ].



Calculate the total surface area of the container.

[3]

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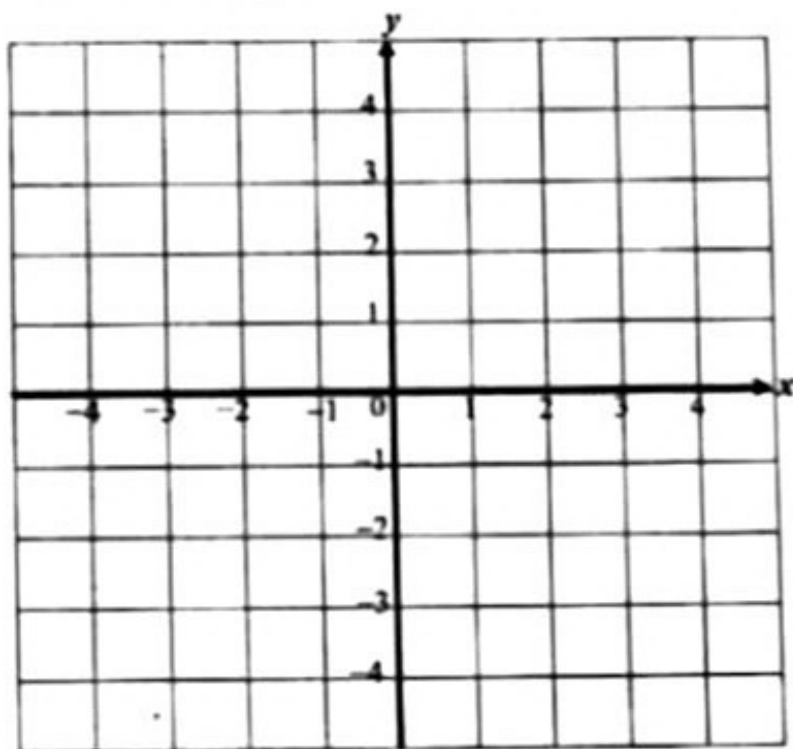
(c) On the XOY-plane below,

(i) plot the points  $L(-4, 3)$ ,  $M(4, 1)$  and  $N(1, -1)$ ,

[3]

(ii) draw the graph of  $y = -3$ .

[1]



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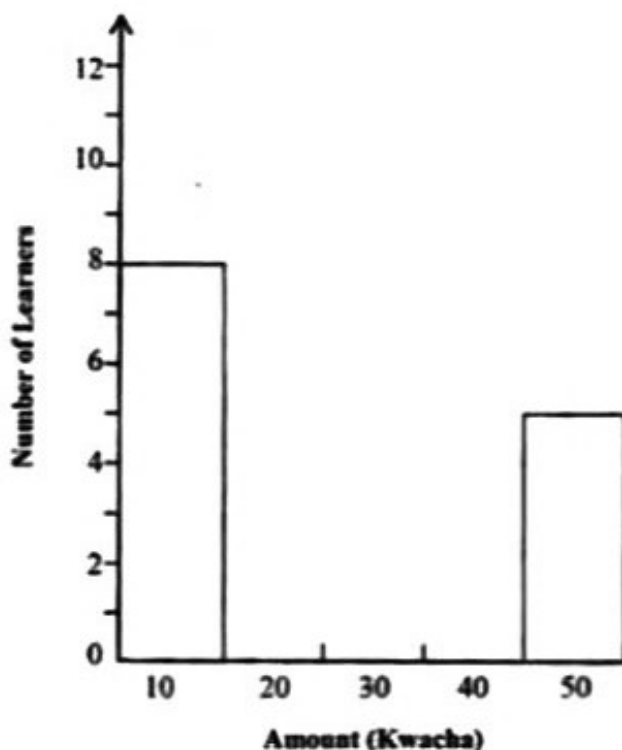
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- 8 (a) Mapulamba is paid K20.00 per hour for a 30 hour week and the rate of over-time is 'double rate'. Calculate his total wage in a week in which he worked for 40 hours. [3]

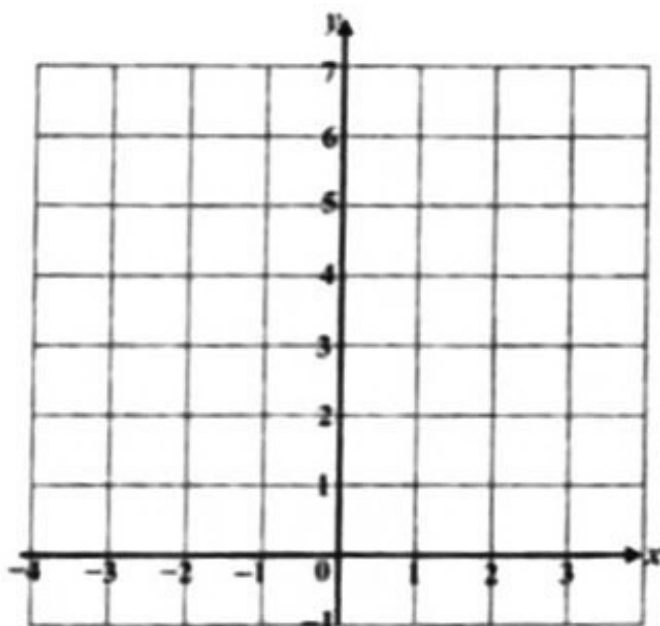
- (b) The table below shows the amount of money spent by 40 learners in a school tuckshop in a particular week.

Amount (Kwacha)	10	20	30	40	50
Number of learners	8	12	9	6	5

Use this information to complete the bar chart below. [3]



- (d) Illustrate the solution of  $y \leq x + 4$  on the XOY plane shown below, by shading the wanted region, for the domain  $-4 \leq x \leq 3$ . [3]



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[Total : 10]

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EXAMINATIONS COUNCIL OF ZAMBIA  
JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2018

# Mathematics 401/2

## Paper 2

(INTERNAL CANDIDATES)

Reading Time: 10 Minutes

Marks: 50

Working Time: 2 Hours

Candidate Name: .....

Examination Number: .....

School/Centre: .....

### Instructions to candidates

- 1 Write your name, examination number and school/centre in the spaces provided on the question paper.
- 2 There are eight (8) questions in this paper. Answer any five (5) questions.
- 3 Answer all questions in the spaces provided on the question paper.
- 4 Write your answers clearly.
- 5 All essential working must be shown. Candidates will be penalized for omitting essential working.
- 6 Tick (✓) the question you have attempted in the grid provided below.

Questions	1	2	3	4	5	6	7	8	Total marks
Tick									
Mark									

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### Information for candidates

Cell phones and calculators are not allowed in the examination room.

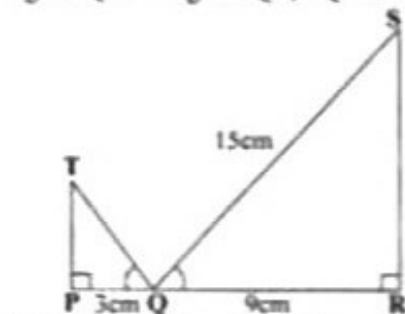
**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

1 (a) Solve the equation  $4x - (8 - x) = x + 4$ . [2]

(b) Evaluate  $1001101_{\text{two}} + 111_{\text{two}}$  giving your answer in base two. [2]

(c) Given that  $p = 8 + \frac{6}{q}$ , make  $q$  the subject of the formula. [3]

- (d) In the diagram below, PQR is a straight line, angle QPT = angle QRS =  $90^\circ$ , angle PQT = angle RQS, PQ = 3cm, QR = 9cm and QS = 15cm.



Calculate the length of QT.

[3]

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[Total : 10]

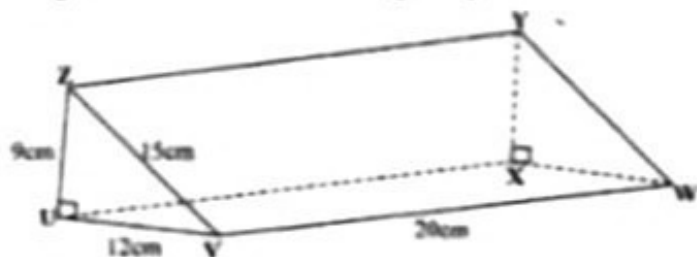
- 2 (a) Express 18 468.5 in standard form correct to 3 significant figures. [2]

- (b) Calculate the sum of the interior angles of a 9 sided polygon. [2]

- (c) Given that  $P = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$  and  $Q = \begin{pmatrix} 3 & 4 \\ -2 & -1 \end{pmatrix}$ , find the matrix  $PQ$ . [3]

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- (d) The diagram below shows a triangular prism UVWXYZ.



Given that angle  $VUZ = \text{angle } WXY = 90^\circ$ ,  $UV = 12\text{cm}$ ,  $VW = 20\text{cm}$ ,  $VZ = 15\text{cm}$  and  $UZ = 9\text{cm}$ , calculate the volume of the prism. [3]

[Total: 10]

- 3 (a) Matrix  $A = \begin{pmatrix} 4 & -6 \\ 0 & 3 \end{pmatrix}$  and matrix  $B = \begin{pmatrix} -6 & 2 \\ 8 & 4 \end{pmatrix}$ . Find  $\frac{1}{2}B + A$ . [3]

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- (b) Solve the simultaneous equations

$$x - 2y = 1,$$

$$2x - 3y = 4.$$

[3]

- (c) The table below shows the corresponding values of  $x$  and  $y$ .

$x$	-1	0	1	2	$a$
$y$	-3	0	3	6	12

- (i) Find the function that describes the relationship between  $x$  and  $y$ .

[2]

- (ii) Find the value of  $a$ .

[2]

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[Total : 10]