



EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) - 2017

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									

Information for candidates

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

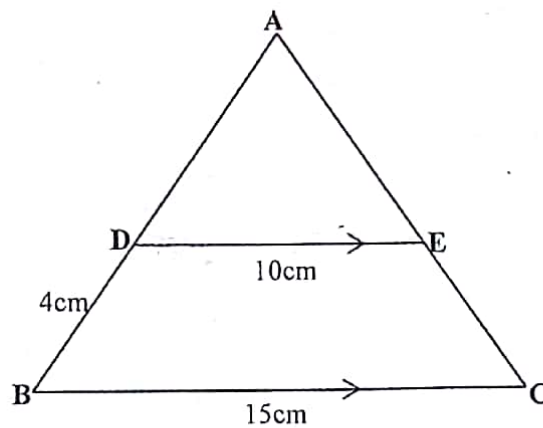
DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

1 (a) Express 0.0005426 in standard form correct to 2 decimal places. [2]

(b) Evaluate $110110_{\text{two}} \div 110_{\text{two}}$, giving your answer in base two. [2]

(c) Solve the simultaneous equations
 $2x + y = 14$,
 $x + y = 4$. [3]

- (d) In the diagram below, ADB and AEC are straight lines. DE is parallel to BC, $DE = 10\text{cm}$, $BC = 15\text{cm}$ and $BD = 4\text{cm}$.



Calculate AD.

[3]

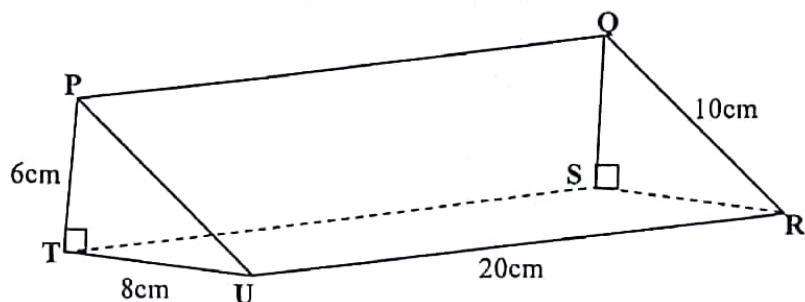
[Total: 10]

2 (a) Solve the equation $\frac{x}{2} + \frac{x}{3} = 5$. [2]

(b) A boy has 3 oranges and 5 lemons of the same size in a basket. Find the probability of randomly picking an orange from the basket. [2]

(c) Given that $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & 2 \\ 4 & 3 \end{pmatrix}$, find the matrix AB . [3]

- (d) The figure PQRSTU below is a triangular prism.



Given that $RU = 20\text{cm}$, $PT = 6\text{cm}$, $TU = 8\text{cm}$ and $QR = 10\text{cm}$, find the surface area of the prism. [3]

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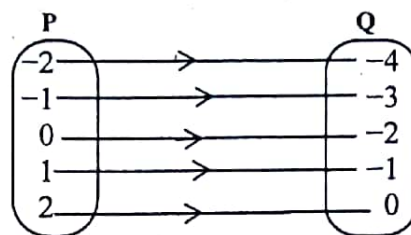
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- 3 (a) Given that $A = \begin{pmatrix} 2 & 0 \\ -3 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 1 \\ 4 & -2 \end{pmatrix}$, find $2A - B$. [3]

- (b) Given that $h = \frac{2x-4}{3+x}$, make x the subject of the formula. [3]

- (c) The arrow diagram below is a mapping from set P to set Q.



- (i) If $x \in P$ and $y \in Q$, find the formula for this mapping. [2]

- (ii) Find the value of x when $y = 3$. [2]

[Total: 10]

- 4 (a) Calculate the sum of interior angles of a 10 sided regular polygon.

[2]

- (b) A car was purchased at K24 000.00. Calculate the value of the car after 1 year, if depreciation for this period was 20%.

[3]

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- (c) (i) Use geometrical instruments to construct triangle ABC in which $AB = 4\text{cm}$, $BC = 5\text{cm}$ and $AC = 6\text{cm}$. [1]
- (ii) Measure and write the size of angle ABC. [1]
- (iii) Bisect the sides AB and BC and let the bisectors meet at O. [2]
- (iv) With centre O and radius OA, draw a circle which touches the vertices A, B and C. [1]

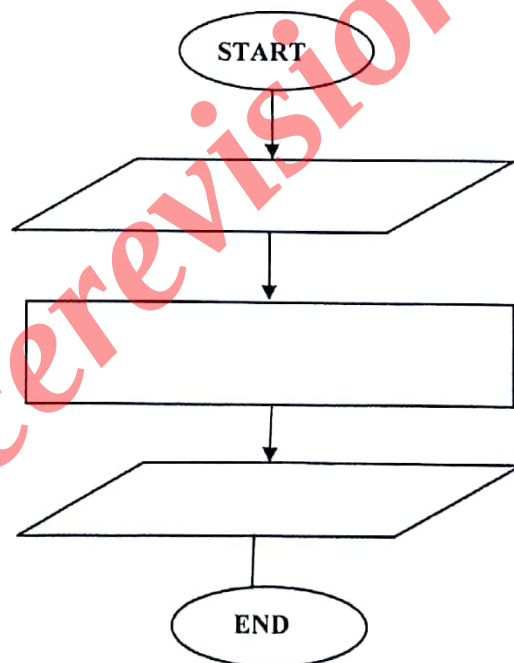
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[Total: 10]



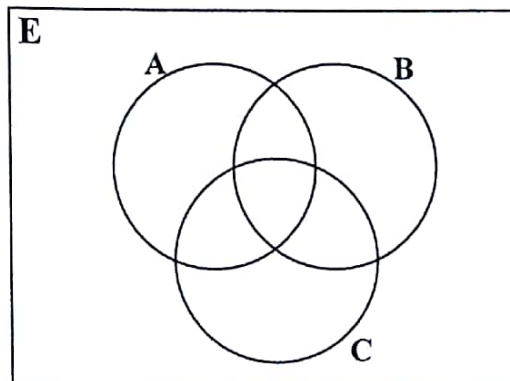
- 5 (a) On a particular day, the exchange rate between the Zambian Kwacha and American dollar was \$1 = K9.50. How many dollars could be exchanged for K28 500.00? [3]

- (b) Given three numbers x , y and z , complete the flow chart below to calculate the mean (M) of the numbers. [3]



- (c) Given that $E = \{x: 1 \leq x \leq 14, x \in \mathbb{N}\}$, $A = \{1, 3, 5, 7, 9\}$,
 $B = \{1, 2, 3, 4, 6, 12\}$ and $C = \{2, 3, 5, 11, 13\}$,

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



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

[Total: 10]

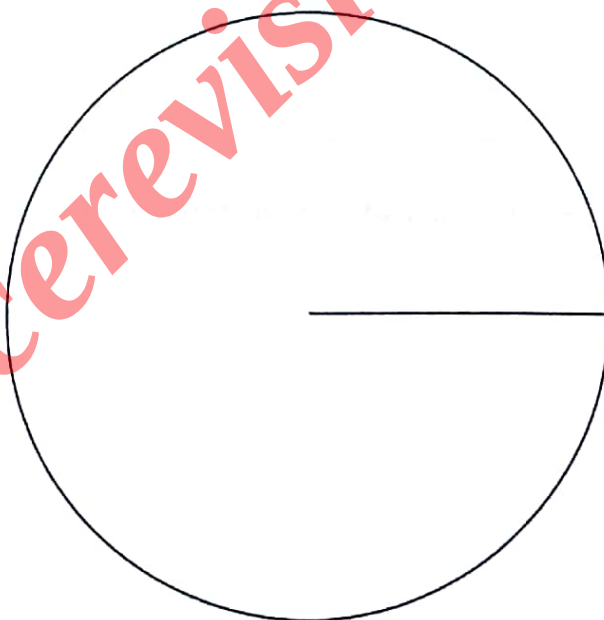
- 6 (a) Multiply 34_{five} by 23_{five} , giving your answer in base five. [3]

- (b) A salesman has a fixed monthly salary of K1 000.00. He receives a commission of 5% on all his sales. If the total sales for a year amounts to K320 000.00, calculate his annual income. [3]

- (c) The favourite colours of 30 learners in a Grade 9 class are shown in the frequency table below.

Colour	Green	Blue	Red	Yellow
Frequency	13	5	8	4

Complete the pie chart below to illustrate this information. [4]

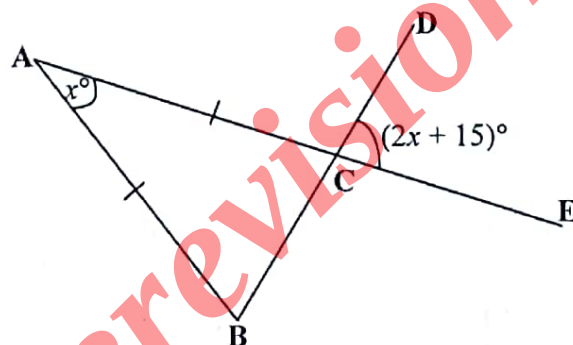


[Total: 10]

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

[2]

- (b) In the diagram below, ACE and BCD are straight lines. $AB = AC$, angle $BAC = x^\circ$ and angle $DCE = (2x + 15)^\circ$.

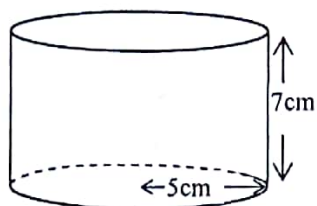


Find the value of x .

[2]



- (c) The diagram below is a cylinder of radius 5cm and height 7cm.

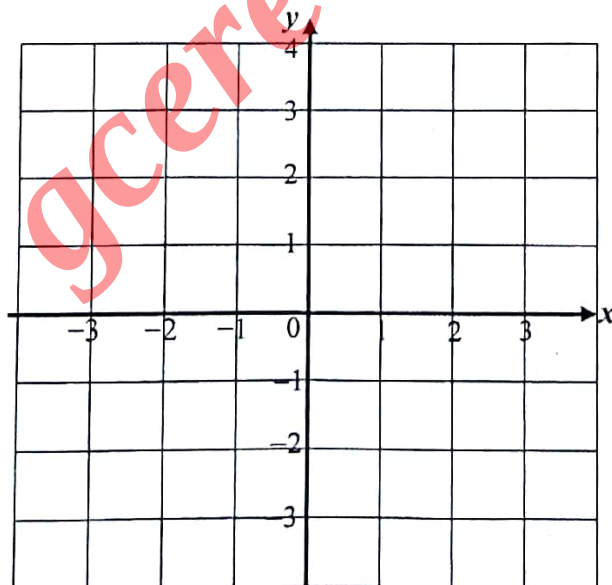


Calculate its volume. [Take π as $\frac{22}{7}$].

[3]

- (d) Illustrate the solution of $y \geq x + 1$ on the XOY plane shown below, by shading the wanted region, for the domain $-3 \leq x \leq 3$.

[3]

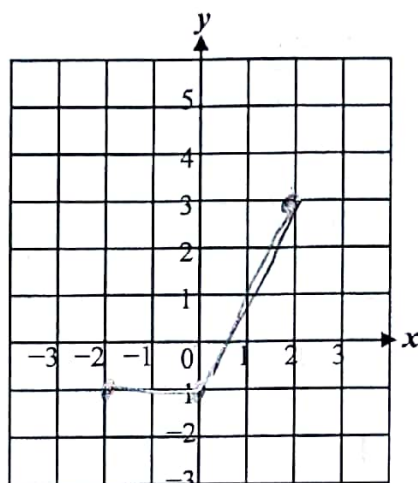


[Total: 10]

8 (a) On the XOY plane below,

(i) plot the points $A(-2, -1)$, $B(0, 1)$ and $C(2, 3)$, [3]

(ii) draw the graph of the straight line $y = x + 2$. [1]



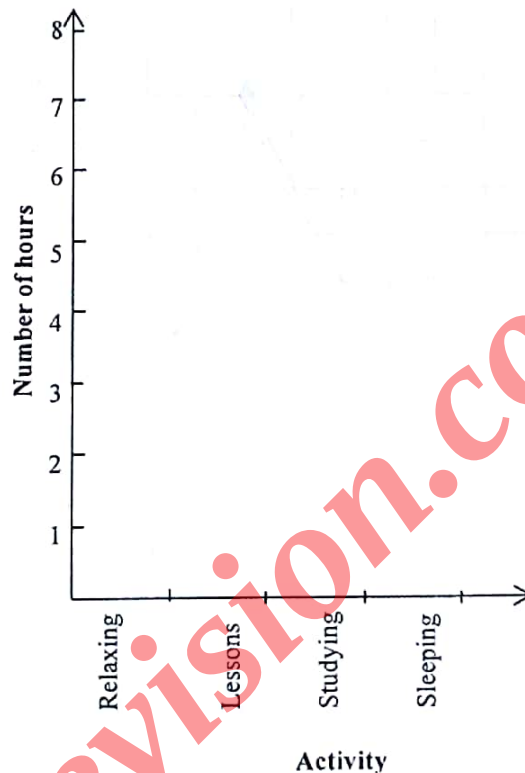
(b) A woman's basic rate per hour is K5.00 and her overtime rate is 'time and a half'. If in a certain week she worked for 45 hours instead of 40 hours normal working hours, calculate her wage for that week. [3]

- (c) The table below shows how Mwanga spends his time in a day.

Activity	Relaxing	Lessons	Studying	Sleeping
No. of hours	6	7	3	8

Use this information to complete the bar chart below.

[3]



[Total: 10]

