

UNIVERSITY OF GHANA BASIC SCHOOL, LEGON
FIRST MOCK EXAMINATION – 2025



03003/2&1 MOCK 1
OCTOBER, 2025
MATHEMATICS 2 & 1
Essay and Objective
2 hours

2 & 1

Name:

Index No: Class:

Candidate's Signature:

PAPER 2

Answer **four** questions only
All questions carry equal marks

All workings must be clearly shown. Marks will **not** be awarded for correct answers without corresponding working.

1. (a). Given that $A = \{\text{factors of } 12\}$, $B = \{\text{positive odd numbers}\}$ are subsets of $\mu = \{x: 1 \leq x \leq 19, \text{ where } x \text{ is a counting number}\}$.
 - i. List the element of $A \cap B$
 - ii. List all the subset in $A \cap B$

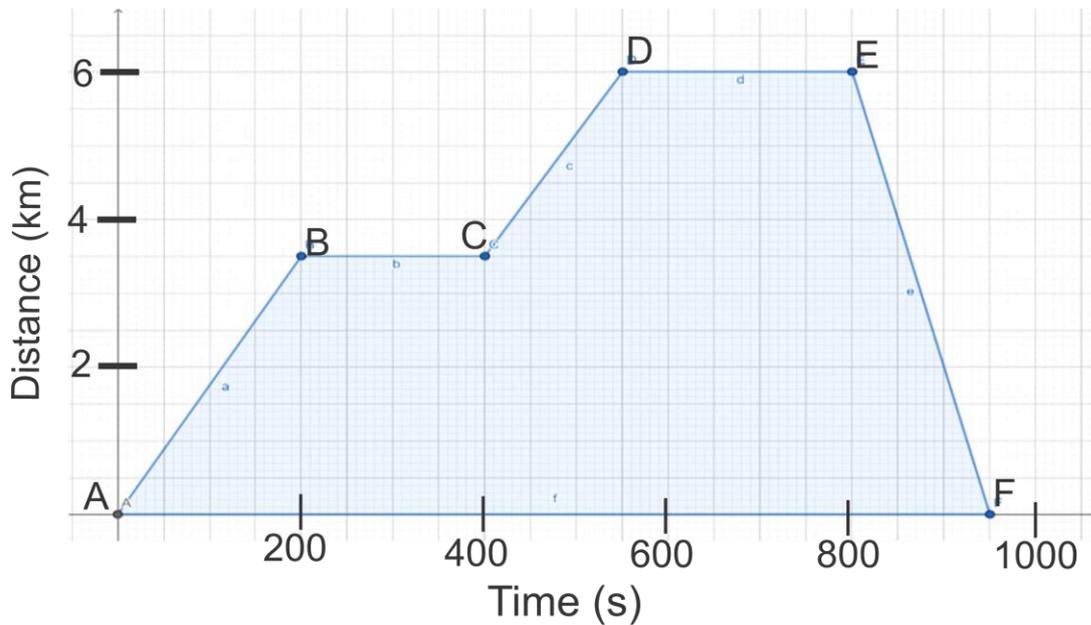
- (b). If $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$,
 - i. express v in terms of u and f
 - ii. using the results in (b)i, find the value of v when $u = 2$ and $f = -3$

2. (a) Evaluate $\frac{2000 \times 0.12}{0.06 \times 0.001}$, leaving your answer in standard form.

- (b) A rectangular field of x cm by 250cm is to be fenced with a 24m wire mesh, calculate
 - i the value of x
 - ii the area (in metres) of the field

3. (a) Three points A, B and C are located on a plane such that $A(3,5)$, $C(-5,0)$ and $\overrightarrow{AB} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}$.
Calculate:
 - i. the coordinate of the point B.
 - ii. $|\overrightarrow{OB}|$

- (b) A cylindrical tank contains 4500litres of water and $\frac{1}{15}$ is used for cleaning.
 - i find the volume of water used for cleaning
 - ii what is the ratio of the volume of water left in the tank to the volume of water used?



4. (a) The diagram above shows the graph of the journey embarked by a motorist who travelled from Anom(A) to Edukrom(E) but made some stops at Subin(B) and Nkanta(D). Calculate:
- The distance from Anom to Edukrom
 - The duration (in minutes) he stayed during his stops
 - The average speed of his return journey.

(b) Simplify $4\sqrt{50} + 3\sqrt{45} - 2\sqrt{2} + 2\sqrt{5}$

5. (a) The marks obtained by L3 learners in a Mathematics Test is as shown below
- 59 67 49 78 95 76 54 58 44 79 39 79 78 65 81 66
79 86 75 68 57 45 66 58 68 80 64 77 65 82 91 94
- construct a stem and leaf plot for the distribution
 - Find the median mark.

(b) The interior angles of a pentagon are 100° , 120° , and 108° . Find the size of the remaining two angles if one of them is three times the other, find the value of the least angle.

6. (a) Mr Boakye borrowed GHC 5400.00 to pay for his child's school fees. If he borrowed at a rate of 6% simple interest per annum for 8 months, find the interest paid.

(b) A man shared an amount of money among his children. The first child had $\frac{2}{5}$ of the amount and the second child had 50cedis more than the first. If the third child had GHC 200.00, find how much:

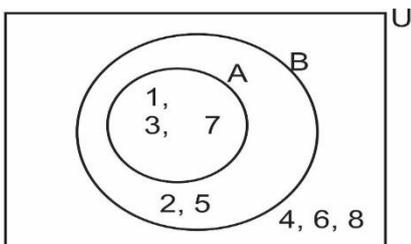
- the man shared;
- the first child received;
- the second child received;

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YOU WILL BE PENALIZED SEVERELY IF YOU ARE FOUND LOOKING
AT THE NEXT PAGE BEFORE YOU ARE TOLD TO DO SO

- Use **2B** pencil throughout.
 - On the answer sheet, write your surname followed by your other names, your index number, subject name, centre number.
 - In the boxes marked Candidate Number, Centre Number and Paper Code, reshade each of the shaded spaces.
- Find the **correct** option for **each** question and shade in **pencil** on your answer sheet the space which bears the same letter as the option you have chosen.

Answer **all** questions.

- If $8n + 3 = 19$ find the value of n .
 - 6
 - 4
 - 3
 - 2
- Two brand of microwave oven A and B cost GH¢6,000.00 and GH¢8,000.00 respectively. A firm budgeted for GH¢80,000.00 to buy microwave oven. If the firm budget for 10 units of brand A instead of brand B. How much did it save?
 - GH¢74,000.00
 - GH¢15,000.00
 - GH¢10,000.00
 - GH¢20,000.00
- Kofi and Esi shared an amount of money in the ratio 2:5. If Esi used GH¢150.00 more than Kofi, how much did they share?
 - GH¢350.00
 - GH¢250.00
 - GH¢450.00
 - GH¢550.00



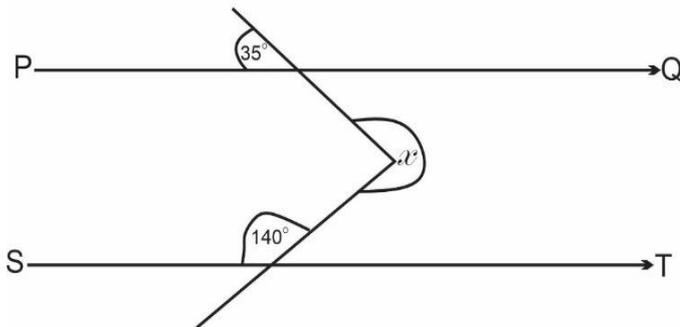
In the diagram A and B are two sets and U the universal set. Use the information to answer question 4 and 5.

- Find $A \cap B$
 - {1, 3, 7}
 - {3, 7}
 - {1, 2, 3, 7}
 - {4, 6, 8}
- How many elements are in the set B?
 - 3
 - 5
 - 7
 - 8
- John rode a bicycle to a point such that he is always the same distance from two villages M and N. Which of the following best describes the locus of John?
 - An arc passing through MN
 - A circle passing through line MN
 - Straight line MN
 - Perpendicular bisector of line MN
- A bag of maize weight 4kg. If the empty bags weighs 150g. Find the weight of the maize.

[1kg = 1000g]

 - 3.500kg
 - 4.350kg
 - 4.150kg
 - 3.850kg

8. Andrews drew three lines such that the length of the first one is 10cm, the second is 15cm longer than the first one and the third is 9cm less than the second. Find the length of the third line.
- 4cm
 - 14cm
 - 16cm
 - 34cm



NOT DRAWN TO SCALE

In the diagram, line PQ is parallel to line ST.
Find the value of the angle marked x .

- 290°
 - 285°
 - 225°
 - 140°
9. A hawker is carrying a basket load of three types of vegetables, tomatoes, okro, and onions. If $\frac{2}{5}$ of the vegetables are tomatoes and $\frac{6}{25}$ okro, what percentage of the fruits are onions?
- 9%
 - 18%
 - 36%
 - 64%
10. Araba is three years younger than her sister. If the sum of their ages is 17years, find Araba's age.
- 7 years
 - 8 years
 - 9 years
 - 10 years

11. A number of mangoes are shared among 50 pupils and each got 15 oranges. If the same number of oranges are shared equally among 30 students, how many will each pupil get?
- 25
 - 20
 - 15
 - 13

12. If the bearing of S from T is 120° , find the bearing of T from S.
- 300°
 - 150°
 - 100°
 - 060°

13. Given the vector $\mathbf{a} = \begin{pmatrix} 5 \\ -1 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$, find $2\mathbf{a} + \mathbf{b}$
- $\begin{pmatrix} -6 \\ 0 \end{pmatrix}$
 - $\begin{pmatrix} 6 \\ 0 \end{pmatrix}$
 - $\begin{pmatrix} 0 \\ -6 \end{pmatrix}$
 - $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$

14. Simplify $\frac{27^{m+1}}{3^{m+2}}$
- 3^{2m}
 - 3^{2m-1}
 - 3^{2m+1}
 - 3^{2m+2}

15. There are 15 white and 25 black identical balls in a bag. If a ball is selected at random from the bag, find the probability that it is white
- $\frac{1}{25}$
 - $\frac{3}{8}$
 - $\frac{1}{15}$
 - $\frac{5}{8}$

16. The area of a rectangle is 18cm^2 . If the width is 2cm. Find the perimeter
- 18cm
 - 20cm
 - 22cm
 - 36cm
17. An article which cost GH¢600.00 was sold at a discount of 10%. Find the selling price
- GH¢60.00
 - GH¢504.00
 - GH¢560.00
 - GH¢540.00
18. A frog leaps in such a way that its distance in meters, from its stationary position after each leap is given by
4, 7, 10, ...
Find the distance from the starting point to the 10th leap.
- 28
 - 31
 - 34
 - 37
19. A truck departed from Kumasi at 9:15pm and arrived in Tamale at 2:45am the next day. How long did the journey take?
- 4hours 20mins
 - 4hours 30mins
 - 5hours 30 mins
 - 5hours 20mins
20. Madam Joyce wants to know which of the teachers in her school is liked best by most of the students. Which of the following is most suitable for collecting data
- Experiment
 - Database
 - Observation
 - Questionnaire

21. Mensah packed 1800 mangoes into a number of boxes, if each box contained 120 mangoes, how many boxes were fully packed?
- 15
 - 16
 - 17
 - 18
22. The cost of three items at a shop are GH¢72.00, GH¢1,105.00, and GH¢216.00. If a customer bought all the three items and received a change of GH¢107.00, how much did he initially give the shop keeper?
- GH¢1300.00
 - GH¢1400.00
 - GH¢1500.00
 - GH¢2000.00

No. of die	1	2	3	4	5	6
Frequency	4	3	3	2	3	5

The table shows the results when a student tossed a die many times. Use the information to answer questions 24 and 25.

23. Find the mode
- 3
 - 4
 - 5
 - 6
24. How many times did the student throw the die?
- 6
 - 18
 - 20
 - 21

26. A story book contains 50 pages. If a student reads 10 pages per hour, find the relationship between the number of unread pages (N) and time (t).

- A. $N=10t + 50$
 $N=-10t + 50$
- B. $N=\frac{1}{10}t + 50$
- C. $N=10t - 50$

27. In how many years will GH¢100,000.00 amount to GH¢200,000.00 at 5% per annum simple interest?

- A. 5 years
- B. 15 years
- C. 10 years
- D. 20 years

28. Expand and simplify $6(7a - 4) - 3(8a + 9)$

- A. $18a - 3$
- B. $18a + 51$
- C. $42a - 27$
- D. $66a - 3$

29. Factorize $xy + 5x + 2y + 10$

- A. $(x + 5)(2y + 10)$
- B. $(x + 2)(y + 10)$
- C. $(x + 5)(y + 2)$
- D. $(x + 2)(y + 5)$

30. Mr Danso bought 200 bags of maize for his farm animals. If he used 60 bags to feed the animals, find the percentage of maize left.

- A. 70%
- B. 60%
- C. 50%
- D. 40%

31. A woman spends GH¢280.00 out of his weekly wage of GH¢350.00 and saves the rest. What percentage did she save?

- A. 10%
- B. 15%
- C. 20%
- D. 25%

32. A farmer feeds 10 goats with 250kg of maize. How many goats can he feed with 100kg of maize?

- A. 2
- B. 8
- C. 4
- D. 10

33. Solve $2^x - 8 \times 2^0$

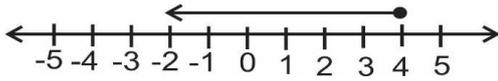
- A. $x = 3$
- B. $x = 2$
- C. $x = -2$
- D. $x = -3$

34. John has 4 one cedi notes and orders a cake for GH¢1.75 and three toffees at 50p each.

How much does he have left?

- A. GH¢0.75
- B. GH¢1.25p
- C. GH¢1.75p
- D. GH¢2.25p

35. Which of the following inequalities represent the number line?



- A. $x < 2$
- B. $x \leq 2$
- C. $x > 4$
- D. $x \leq 4$

36. Multiply $(4a - 7)$ by $(4a + 7)$

- A. $64s^2 - 49$
- B. $16a^2 - 49$
- C. $64s^2 + 49$
- D. $16a^2 + 49$

37. The population of a school is 86792. What is this number to two significant figures?

- A. 86700
- B. 87000
- C. 867
- D. 86

38. Find the least value of the following numbers

-1, 0, -6, -3

- A. 0
- B. -3
- C. -6
- D. -1

39. Describe the set of $A = \{2,3,5,7,11,13,17,19\}$

in words.

- A. $A = \{\text{prime numbers less than } 30\}$
- B. $A = \{\text{factors of } 18\}$
- C. $A = \{\text{odd numbers up to } 19\}$
- D. $A = \{\text{whole numbers greater than } 25\}$

40. What is the missing number in the sequence -

7, -3, 1, ____, 9?

- A. -2
- B. 5
- C. 6
- D. 8