

GHANA EDUCATION NEWS (GEN MOCK)

HOME MOCK SEPTEMBER 2022

MATHEMATICS 1 & 2



Name.....

Index Number.....

GHANA EDUCATION NEWS (GEN MOCK)

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GHANA EDUCATION NEWS MOCK – SEPTEMBER 2022 EDITION

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PERFORMANCE BOOSTER - MOCK NUMBER 4

SEPTEMBER 2022

MATHEMATICS

2 Hrs

Do not open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your name and index number in ink in the spaces provided above.

This booklet consists of two papers; I and II. Answer Paper 2 which comes first in your answer booklet and Paper 1 on your Objective Test answer sheet. Paper 2 will last for 1 hr after which the answer book let will be collected. Do not start Paper until you are told to do so. Paper 1 will last 1 hour .

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TURN OVER

MATHEMATICS 2

ESSAY

Answer four questions only.

All questions carry equal marks.

All working must be clearly shown.

*Marks will **not** be awarded for correct answers without corresponding working*

1. List the members of each of the sets
 $B = \{\text{Whole numbers from 20 to 30}\}$. $D = \{\text{factors of 63}\}$
 - (a) List the members of
 - (i) $B \cap D$
 - (ii) $B \cup D$
 - (b) In a class of 60 students, 46 passed Mathematics and 42 passed English language. Everybody passed at least one of the two subjects.
 - (i) Illustrate this information on a Venn diagram
 - (ii) How many students passed in both subjects?
2. Using a ruler and a pair of compasses only,
 - (a) construct the triangle XYZ, in which $|YZ| = 6\text{cm}$, angle $XYZ = 60^\circ$ and $|XZ| = 9\text{cm}$. Measure $|XY|$
 - (b)
 - (i) construct the mediator of YZ.
 - (ii) draw a circle, centre X and radius 5cm. Measure $|YA|$, where A is the point of intersection of the mediator and the circle in the triangular region XYZ
3. A landlady rented out her house for $\text{€}240,000.00$ for one year. During the year she paid 15% of the rent as income tax. She also paid 25% of the rent as property tax and spent $\text{€}10,000.00$ on repairs.
Calculate:
 - (a) The landlady's total expenses.
 - (b) The remainder of the rent after the landlady's expenses.
 - (c) The percentage of the rent she spent on repairs.

4. Using a scale of 2cm to 1 unit on both axis, draw two perpendicular lines OX and OY on a graph sheet. Mark the x-axis from -5 to 5 and the y-axis from -6 to 6 . Mark the origin O. Draw on the same graph sheet, indicating in each case, the co-ordinates of all the vertices,

- (i) The square ABCD where A (1,2), B(4, 2), C(4,5) and D(1,5)
- (ii) Using the y-axis as a mirror line draw the image $A_1B_1C_1D_1$ of square ABCD where $A \rightarrow A_1$, $B \rightarrow B_1$, $C \rightarrow C_1$ and $D \rightarrow D_1$
- (iii) Draw an enlargement $A_2B_2C_2D_2$ of the square ABCD with scale factor -1 from O, such that $A \rightarrow A_2$, $B \rightarrow B_2$, $C \rightarrow C_2$ and $D \rightarrow D_2$
- (iv) What single transformation maps $A_2B_2C_2D_2$ onto the square $A_1B_1C_1D_1$?

5. (a) The data below shows the distribution of the ages of workers in a factory.

Age (in years)	No. of workers
19	3
24	7
29	8
34	4
39	5
44	3

- (i) How many workers are there in the factory?
- (ii) What is the modal age of the distribution?
- (iii) Calculate the mean age of the workers, correct to one decimal place.

$$I = \frac{P \times T \times R}{100}$$

(b) (i) Make T the subject of the relation

(ii) If $I = \text{¢}40,000.00$, $P = \text{¢}64,000.00$ and $R = 25\%$, find the value of T in years

6. (a) The volume of a cylinder is 220cm^3 . The radius of the cross-section is 2.5cm . Find the height of the cylinder. (Take $\pi = 22/7$)

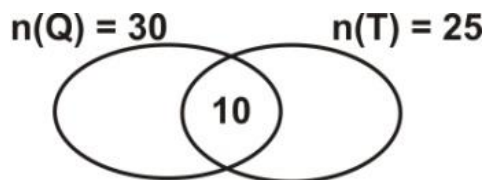
(b) Each of the interior angles of a regular polygon is 140° . How many sides does it have?

MATHEMATICS 1

OBJECTIVE TEST

45 minutes

1. If $P = \{7, 9, 13\}$, $Q = \{1, 7, 13\}$. Find $P \cap Q$
- A. $\{1, 7, 13\}$
B. $\{1, 9, 13\}$
C. $\{7, 13\}$
D. $\{7, 9, 13\}$
2. $P = \{\text{odd numbers between 20 and 30}\}$ and $Q = \{23, 29\}$. Which of the following is true?
- A) $P \subset Q$
B) $Q \subset P$
C) $P = Q$
D) $P \cap Q = \Phi$
3. In the diagram, set Q has 30 members and set T has 25 members. $Q \cap T$ has 10 members. Find the number of members of $Q \cup T$.



- A) 35
B) 45
C) 55
D) 65
4. Which of these has the least number of lines of symmetry?
- A) an equilateral triangle
B) a square
C) a circle
D) an isosceles triangle

5. Which of the following is not a prime number?
- A) 3
 - B) 5
 - C) 7
 - D) 9
6. Divide $(1\frac{1}{2} + \frac{1}{4})$ by $(1\frac{1}{2} - \frac{1}{4})$
- A) $\frac{5}{7}$
 - B) 1
 - C) $1\frac{2}{5}$
 - D) $1\frac{3}{4}$
7. Kojo, Ebo and Ama share ₦14,000.00 among themselves. Kojo had twice as much as Ebo and Ebo also had twice as much as Ama. How much did Ebo get?
- A) ₦8,000.00
 - B) ₦6,000.00
 - C) ₦4,000.00
 - D) ₦3,000.00
8. Arrange the following fractions in descending order $\frac{9}{16}, \frac{5}{8}, 0.62$
- A) $\frac{9}{16}, 0.62, \frac{5}{8}$
 - B) $0.62, \frac{5}{8}, \frac{9}{16}$
 - C) $\frac{5}{8}, \frac{9}{16}, 0.62$
 - D) $\frac{5}{8}, 0.62, \frac{9}{16}$
9. In the relation $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$ if $R_1 = 1$ and $R_2 = 3$, find R
- A) $\frac{1}{2}$
 - B) $\frac{2}{3}$
 - C) $\frac{3}{4}$
 - D) $\frac{3}{2}$
10. Calculate, correct to two decimal places, $0.61 \div 0.8$

- A) 0.07
- B) 0.08
- C) 0.76
- D) 0.83

11. A pencil sells at ₵180.00 and an eraser sells at ₵120.00. How much will you pay if you buy three pencils and four erasers?

- A) ₵1,020.00
- B) ₵1,080.00
- C) ₵1,200.00
- D) ₵1,280.00

12. On a map 1cm represents 4.5km. What is the actual distance between two towns which are 4cm apart on the map?

- A) 9km
- B) 16km
- C) 18km
- D) 19km

13. 8 girls can weed a plot of land in 10 days. How many days will 5 girls take to weed the same plot of land, working at the same rate?

- A) 6 days
- B) 8 days
- C) 12 days
- D) 16 days

14. I gave a storekeeper a GH₵10.00 note for goods I bought. He asked me for another 15Gp for ease of change. If he then gave me 50 Gp, how much did I pay for the goods?

- A. GH₵ 9.35
- B. GH₵ 9.45
- C. GH₵ 9.65
- D. GH₵ 10.65

15. Calculate the simple interest on ₦130,000.00 for $2\frac{1}{2}$ years at 12% per annum.
- A) ₦78,000.00
 - B) ₦39,000.00
 - C) ₦36,000.00
 - D) ₦31,200.00
16. A hall which is 8m long is represented on a diagram as 4 cm long. What is the scale of the diagram?
- A. 1:200
 - B. 1:250
 - C. 1:400
 - D. 1:800
17. If $c = \frac{b^2 + 4r}{2ar}$, find c when $b = 3$, $r = 4$ and $a = 5$.
- A) $\frac{19}{40}$
 - B) $\frac{11}{20}$
 - C) $\frac{3}{8}$
 - D) $\frac{5}{8}$
18. Solve the equation $\frac{x+2}{3} + 2x = 10$.
- A) 3
 - B) 4
 - C) 5
 - D) 6
19. Jojo and Fiifi shared an amount of money in the ratio 3:4 respectively. If Fiifi had ₦140,000 how much was shared?
- A) ₦200,000.00

- B) ₱220,000.00
- C) ₱245,000.00
- D) ₱280,000.00

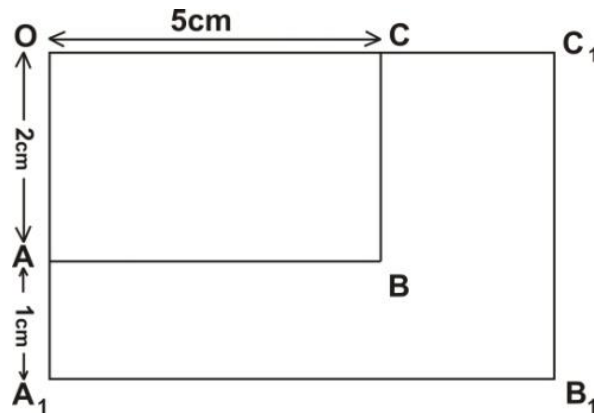
20. Find the angle through which the minute hand of a clock moves from 5:15pm to 5:25pm

- A) 30°
- B) 45°
- C) 60°
- D) 120°

In the diagram below, rectangle OABC is enlarged into rectangle OA₁B₁C₁ from centre O.

$|OC|=5\text{cm}$, $|OA|=2\text{cm}$ and $|AA_1|=1\text{cm}$

Use the diagram to answer Questions 21 and 22



21. Find the scale factor of the enlargement.

- A) 1
- B) 1.5
- C) 2
- D) 2.5

22. Calculate OC₁

- A) 7.5cm

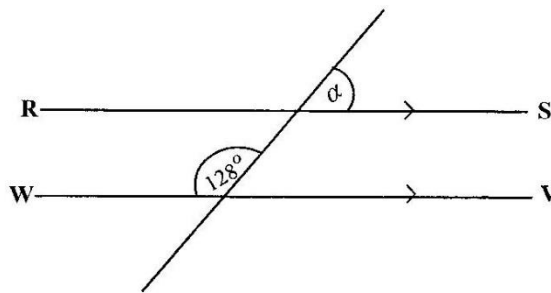
- B) 8cm
- C) 9cm
- D) 12cm

23. Solve the inequality: $7x - (10x + 3) \geq -9$

- A) $x \geq 2$
- B) $x \leq 4$
- C) $x \geq 4$
- D) $x \leq 2$

24. In the diagram below RS and WV are parallel lines. The value of the angle marked α is

- A. 38°
- B. 52°
- C. 58°
- D. 64°



NOT DRAWN TO SCALE

25. Express 3.75 as a mixed fraction.

- A. $3\frac{1}{5}$
- B. $3\frac{1}{4}$
- C. $3\frac{1}{3}$
- D. $3\frac{3}{4}$

26. There are 20 identical balls in a box. Twelve are blue and the rest are green. If one ball is taken at random from the box, find the probability that the ball is green.

- A. $\frac{1}{20}$
- B. $\frac{2}{5}$
- C. $\frac{3}{5}$
- D. $\frac{3}{4}$

27. What name is given to a triangle which has all its sides equal?
- A. Isosceles triangle
 - B. Scalene triangle
 - C. Equilateral triangle
 - D. Right-angle triangle
28. Find the area of a circle whose diameter is 7cm. [Take $\pi = \frac{22}{7}$]
- A. 11 cm^2
 - B. $38\frac{1}{2} \text{ cm}^2$
 - C. $44\frac{1}{2} \text{ cm}^2$
 - D. 54 cm^2
29. Elias bought five books. Their mean price was GHc 3.25. The total cost for four of the books was GHc 11.75. What was the cost of the fifth book?
- A. GHc 3.50
 - B. GHc 4.00
 - C. GHc 4.20
 - D. GHc 4.50
30. Find the image of $Q(-4, 5)$ when rotated anticlockwise through 90° about the origin.
- A. $Q(-5, 4)$
 - B. $Q(-5, -4)$
 - C. $Q(4, -5)$
 - D. $Q(4, 5)$

The following data show the marks of students in a test:
10, 4, 1, 4, 3, 3, 2, 1, 1, 7, 8

Use the information to answer **questions 31 and 32**.

31. If the pass mark is 4, find the number of students who scored more than the pass mark.
- B. 1
 - C. 2
 - D. 3
 - E. 4
32. Find the mean mark.
- A. 3
 - B. 4
 - C. 7
 - D. 8

33. Express $\frac{10}{32}$ as a decimal fraction.

- A. 0.3200
- B. 0.3125
- C. 0.3676
- D. 0.3222

Use the mapping to answer questions 34 and 35

$\frac{1}{2}$	→	1	→	3.14
1	→	2	→	6.28
2	→	4	→	12.56
3	→	6	→	x
y	→	10	→	31.4

34. Find the value of x

- A) 9.42
- B) 12
- C) 18
- D) 18.84

35. Find the value of y

- A) 2
- B) 5
- C) 7
- D) 9

36. If 22% of the length of a rope is 55cm, find the full length of the rope.

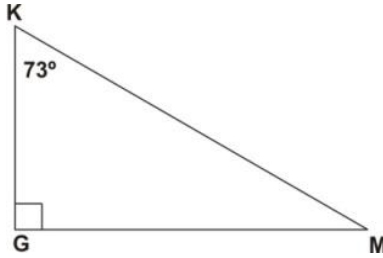
- A) 12.1cm
- B) 25cm
- C) 121cm
- D) 250cm

37. Akosua buys 480 pineapples for ₵24,000.00. She sells all the pineapples for ₵28,000.00. Find her profit percent.

- A) 13.9%

- B) 16.7%
- C) 20%
- D) 40%

38.



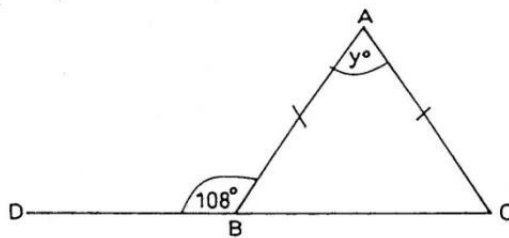
In the diagram above, the angle of elevation of K from M is

- A) 17°
- B) 73°
- C) 90°
- D) 107°

39. The mean of the numbers 4, 3, 3, x is 5, find x

- A) 20
- B) 10
- C) 5
- D) 4

40.



In the diagram above, $\triangle ABC$ is an isosceles triangle. $\angle ABD$ is 108° . Find the value of y .

- A) 72
- B) 60
- C) 48
- D) 36