

FREE VIRTUAL MOCK EXAMINATION (3)

APRIL 2020

MATHEMATICS

ESSAY and OBJECTIVE

2 Hours

2&1

Name:

Index Number.....

GB ASSESSMENT TEST (GBAT)

FREE VIRTUAL MOCK EXAMINATION (3)

April 2020

MATHEMATICS 2 & 1

2 hours

All answers must be provided on clean sheet of papers (Answer booklet).

Write your name and index number in ink in the spaces provided above.

This booklet consists of two papers; Paper 1 and Paper 2. Answer four questions only. All questions carry equal marks.

Answer all questions in your answer booklet.

Credit will be given for clarity of expression and orderly presentation of materials.

DESIST FROM REFERING TO BOOKS BEFORE PROVIDING ANSWERS

#COVID-19. STAY HOME. STAY SAFE.

Answer **four** questions in all. All questions carry equal marks.

1. (a) The table below shows the salaries of workers in Goldablue Consult.

Worker	Salaries (GH¢)
General Manager	1680
Chief Consultant	1440
Assessment Supervisor	1280
Accountant	X
Marketing Consultant	1000
Secretary	Y

- If the monthly budget of the company for workers' salaries is GH¢7,200.00, find the values of x and y when the Secretary's salary is twice that of the Accountant.
 - Express the Accountant's salary as a percentage of the company's monthly budget.
- (b) Draw a pie chart to illustrate the above information.
- (c) If $\overrightarrow{EF} = \begin{pmatrix} -7 \\ 8 \end{pmatrix}$ and $\overrightarrow{UF} = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$, find \overrightarrow{EU} .

2. (a) Using a ruler and a pair of compasses only, construct

- triangle PQR such that $|PQ| = 6\text{cm}$, $|QR| = 7\text{cm}$ and angle PQR = 45° .
- the locus l_1 of points equidistant from QR and PR.
- the locus l_2 of points equidistant from Q and R
- locate the point T, the point of intersection of l_1 and l_2 .
- with center T and radius TP, draw a circle.

- (b) Simplify

- $\frac{3v+2u}{5} + \frac{u-5v}{8} - \frac{3v}{4}$
- $(n+5)(n-5) - 1(-n-25)$

- (c) Efyia took 4 red, 6 green, 3 blue and x number of white marbles and put them in a sack. Find:

- the number of white marbles he put in the sack if the probability of picking a red marble from the sack is $\frac{2}{9}$.
- the probability of **not** picking a blue or white marble from the sack?

3. (a) The lengths of the sides of two squares are 5cm and 7cm. find in its simplest form

- the ratio of their perimeters
- the ratio of their areas.

- (b) Princess was asked to subtract 18 from a certain number and then divide the result by 6, instead she

subtracted 6 from the number and then divided the result by 18, but she still got the correct answer. Find the number she started with.

- (c) The interior angle of a regular polygon is 5 times the exterior angle
- find the interior angle of the polygon.
 - find the exterior angle of the polygon.
 - how many sides has the polygon.
 - what is the name of the polygon.
- (d) Find the value of a $36^{4a+3} = \frac{1}{216}$

4. (a) M and N are subsets of μ , such that
- $\mu = \{\text{whole numbers greater than 45 but less than 55}\}$

$M = \{\text{composite numbers}\}$

$N = \{\text{multiples of 3 that are also odd numbers}\}$

- List the elements of μ , M, N, M^c and N^c
- Find

$\alpha. M \cap N$

$\beta. (M \cup N)^c$

- Represent the above information on a Venn diagram

- (b) The monthly rent of a house was decreased from 40% of the price of the house to 30% of the price of the house. If the new rent for 3 months is GH¢ 5,400.00.
- What was the former rent?
 - What is the price of the house?

- (c) Solve the following operations on rational numbers

$$\left(\sqrt{\frac{9}{25}} + \frac{2}{3}\right) \times \frac{\frac{3}{4}}{\frac{1}{4}}$$

- (d) Calculate the perimeter of a quadrant of a circle of radius 9cm. (Take $\pi = \frac{22}{7}$)

5. (a) Using a scale of 2cm to 2units on both axes, draw on a graph sheet two perpendicular axes OX and OY with the interval $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$.

- (b) Draw, labeling all vertices, indicating the coordinates clearly,

i. $\triangle ABC$ with coordinates A (-1, 2), B (8, -4) and C (6, 0)

ii. the image $\triangle A_1 B_1 C_1$ of $\triangle ABC$ under a reflection in the $y=0$ where $A \rightarrow A_1$, $B \rightarrow B_1$ and $C \rightarrow C_1$

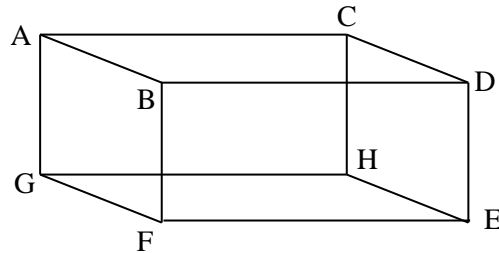
iii. the image $\triangle A_2 B_2 C_2$ of $\triangle ABC$ under an anti-clockwise rotation through 90° about the origin, where $A \rightarrow A_2$, $B \rightarrow B_2$ and $C \rightarrow C_2$.

iv. the image $\triangle A_3 B_3 C_3$ of $\triangle ABC$ under the enlargement from the origin with scale factor -1 where

$$A \rightarrow A_3, B \rightarrow B_3, C \rightarrow C_3.$$

- (c) i. The sum of two consecutive multiples of 9 is 63. Find these multiples.
 ii. Subtract the product of 4.8 and 5.7 from the sum of 6.9 and 9.8.

6. (a) The diagram is a tank in the form of a rectangular prism. $|BF| = 5.5\text{m}$, areas of the sides BDEF and ABFG are 66m^2 and 44m^2 respectively. Find



- i. The total volume of the tank
 ii. The total surface area excluding surface ABCD
- (b) The set $K = \{-2, -1, 0, 1, 2\}$ maps onto Q by the mapping $x \rightarrow x^2 - 2$, where $x \in K$.
- i. Find the elements of M
 ii. Draw a diagram showing the mapping between K and M
- (c) Riding a bicycle at 12km per hour, Sammy leaves church at 2.15pm and arrives at home at 3:30pm. How far is the church from his home?
- (d) Calculate in an anticlockwise direction the angle formed by the minute hand and the hour hand at 12:25pm.

END OF PAPER

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

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

PAPER 1

1 HOUR

OBJECTIVE TEST

Write your name and index number in ink in the spaces provided above

1. Use **2B** pencil throughout.
2. On the pre-printed answer sheet, check that the following details are correctly printed:
Your surname followed by your other names, the subject Name, your Index Number, Centre Number and the Paper Code.
3. In the boxes marked *Candidate Name*, *Centre Number* and *Paper code*, reshade each of the shaded Spaces.
4. An example is given below. This is for a candidate whose name is Jeffrey Opoku Twum, whose Index Number 0211040067. He is writing the examination at Centre Number 21104 and offering Integrated Science 1 and the Paper code is 2470.

GB ASSESSMENT TEST OBJECTIVE ANSWER SHEET

CANDIDATE NAME:
JEFFREY OPOKU TWUM

SUBJECT NAME:
MATHEMATICS

INSTRUCTIONS TO CANDIDATES

1. Use grade HB pencil throughout.
2. Answer each question by choosing one letter and shading it like this **[A] [B] [C] [D] [E]**
3. Erase completely any answers you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right hand edge of your answer sheets.

CANDIDATE NUMBER									
2	1	1	0	4	0	0	6	7	
0	0	0		0			0	0	
1			1	1	1	1	1	1	
	2	2	2	2	2	2	2	2	
3	3	3	3	3	3	3	3	3	
4	4	4	4		4	4	4	4	
5	5	5	5	5	5	5	5	5	
6	6	6	6	6	6	6		6	
7	7	7	7	7	7	7			
8	8	8	8	8	8	8	8	8	
9	9	9	9	9	9	9	9	9	

CENTRE NUMBER					
2	1	1	0	4	
0	0	0		0	
1			1	1	
	2	2	2	2	
3	3	3	3	3	
4	4	4	4		
5	5	5	5	5	
6	6	6	6	6	
7	7	7	7	7	
8	8	8	8	8	
9	9	9	9	9	

PAPER CODE				
2	4	7	0	
0	0	0		
1	1	1	1	
	2	2	2	
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4		4	4	
5	5	5	5	
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7	7		7	
8	8	8	8	
9	9	9	9	

For Supervisors only.

If Candidate is absent shade this space

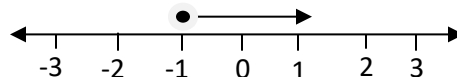


Answer **all** the questions.

Each question is followed by **four** options lettered A to D. 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. Give only **one** answer to each question

- What is the LCM of $2^2 \times 3 \times 5^2$ and $2^2 \times 3^2 \times 5$?
A. $2^2 \times 3 \times 5^2$
B. $2^2 \times 3^2 \times 5^2$
C. $2^3 \times 3 \times 5$
D. $2^3 \times 3^2 \times 5^2$
- Given that $(60 + 2b)^\circ$ and $(b + 54)^\circ$ are supplementary angles, find the value of b.
A. 20°
B. 22°
C. 25°
D. 30°
- Approximate 237.46 to 4 significant figures.
A. 240
B. 237.5
C. 236.5
D. 237
- When two is added to 3 times a certain number, the final result is 6. Find the number.
A. $\frac{4}{3}$
B. $\frac{8}{3}$
C. $\frac{-4}{3}$
D. $\frac{-8}{3}$
- What is the value of the digit 3 in the figure 5647.13?
A. $\frac{3}{10}$
B. $\frac{3}{100}$
C. $\frac{3}{3}$
D. 30
- Evaluate $2a^2 - 5a^2 + 1$ when $a = -2$.
A. -24
B. -26
C. -11
D. 24
- What is the probability of picking a letter T from the word PROSTITUTION?
A. $\frac{1}{4}$
B. $\frac{4}{11}$
C. $\frac{4}{14}$
D. $\frac{5}{12}$

- A blender is priced GH¢ 500.00. Sefa bought it and paid Value Added Tax (VAT) of $12\frac{1}{2}\%$. How much did Sefa pay for the blender?
A. GH¢ 532.00
B. GH¢ 562.50
C. GH¢ 562.00
D. GH¢ 532.50
- Which of the following illustrates the number line below?



- $x > -1$
 - $x \leq -1$
 - $x < -1$
 - $x \geq -1$
- Find the gradient of the line passing through the points A (-12, 20) and B (16, -10)
A. $1\frac{1}{4}$
B. $\frac{-15}{4}$
C. $\frac{14}{5}$
D. $-\frac{1}{4}$

The table shows the distribution of marks obtained by some students in a French test.

Marks	0	1	2	3	4	5	6
Number of students	2	4	5	2	3	1	3

(Use the information to answer questions 11 – 13)

- How many pupils took the test?
A. 30
B. 20
C. 15
D. 25
- Find the median mark
A. 3
B. 4
C. 1
D. 2
- Calculate the mean mark
A. $2\frac{1}{5}$
B. $2\frac{3}{5}$
C. $2\frac{2}{3}$

D. $2\frac{3}{4}$

14. Simply $\left(3\frac{1}{2} + 7\right) \div \left(4\frac{1}{3} - 3\right)$

- A. $7\frac{7}{8}$
- B. $6\frac{7}{8}$
- C. 7
- D. $10\frac{1}{2}$

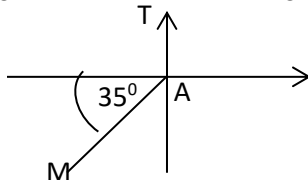
15. Find the product of the number of faces of a tetrahedron and the number of vertices of a rectangular prism.

- A. 12
- B. 18
- C. 24
- D. 32

16. Multiply 6.4×10^{-2} by 8.5×10^4 and leave your answer in standard form.

- A. 54.4×10^2
- B. 5.44×10^1
- C. 5.44×10^{-3}
- D. 5.44×10^3

17. Find the bearing of M from T in the diagram below



- A. 45°
- B. 85°
- C. 235°
- D. 165°

18. Kwabena and Agyare shared an amount of money in the ratio 3:5 respectively. If Agyare received GH¢ 35.00, how much did Kwabena receive?

- A. GH¢ 30.00
- B. GH¢ 21.00
- C. GH¢ 28.00
- D. GH¢ 15.00

19. Freda went to the market and bought 500g of meat, 850g of fish and 900g of eggs. What is the total weight of items she bought in kilograms?

- A. 2.29kg
- B. 2.25kg
- C. 2.35kg
- D. 22.50kg

20. The perimeter of a rectangle is 45cm. If the length and breadth are in the ratio 3: 2 respectively, find the length of the rectangle.

- A. 27
- B. 18
- C. 13.5

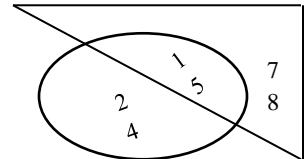
D. 9

21. Four boys can weed a 3-hectare plot of land in 10 days. How long would it take 16 boys to weed the same plot of land if their rate of weeding is the same?

- A. $6\frac{1}{2}$ days
- B. 5 days
- C. $2\frac{1}{2}$ days
- D. 3 days

22. In the Venn diagram below F is the set of numbers inside the circle and G is the set of numbers inside the triangle. Find $F \cap G$.

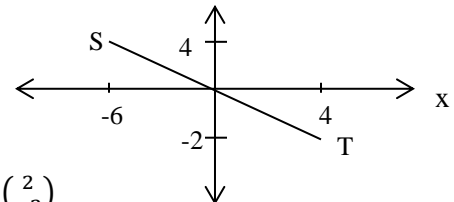
- A. {1,5}
- B. {2,3,4}
- C. {6,7}
- D. {1,2,3,4,5}



23. The locus of points equidistant from two fixed points on a straight line is known as

- A. angle bisector
- B. parallel line
- C. mediator
- D. circle

24. The diagram below shows two points S and T in the number plane. Find the vector \overrightarrow{ST} .



- A. $\begin{pmatrix} 2 \\ -2 \end{pmatrix}$
- B. $\begin{pmatrix} 10 \\ -6 \end{pmatrix}$
- C. $\begin{pmatrix} -6 \\ 10 \end{pmatrix}$
- D. $\begin{pmatrix} 8 \\ -8 \end{pmatrix}$

25. A discount of GH¢ 480.00 was given on an article marked GH¢ 24000. What was the percentage discount?

- A. 10%
- B. 2%
- C. 4%
- D. 5%

26. A desktop monitor was sold for GH¢ 285.00 at a discount of 5%. Calculate the cost price of the desk monitor.

- A. GH¢ 295.00
- B. GH¢ 290.00
- C. GH¢ 300.00
- D. GH¢ 315.00

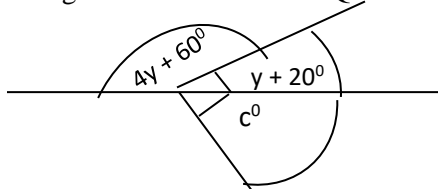
27. What is the square root of $1\frac{9}{16}$?

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

28. The sum of three numbers is 269. Two of the numbers are 138 and -348. Find the third number.

- A. 359
- B. 479
- C. -479
- D. -359

Use the diagram below to answer Q. 29



29. Find the value of y.

- A. 30°
- B. 40°
- C. 20°
- D. 25°

30. What is the image of (15, -8) under the mapping

$$\begin{pmatrix} x \\ y \end{pmatrix} \rightarrow \begin{pmatrix} \frac{1}{3}x \\ 2y+x \end{pmatrix}?$$

- A. (5, -1)
- B. (-1, -5)
- C. (2, -3)
- D. (-3, 4)

31. A rectangle has length 6cm and width v cm. The area is greater than 78cm^2 . How wide is the rectangle?

- A. $v < 13$
- B. $v > 13$
- C. $v < 14$
- D. $v > 15$

32. A bus left Kumasi at 9:35am and reached Bono at 6:45pm. How long was the journey?

- A. 2hrs 50mins
- B. 3hrs 10mins
- C. 9hrs 10mins
- D. 16hrs 20mins

33. If 1: k is equivalent to $6\frac{1}{4} : 25$, find k.

- A. 4
- B. 6.25
- C. 24
- D. 100

34. A ship is travelling at an average speed of 90km/h. What is its speed in meters per second (m/s)?

- A. 25m/s
- B. 30m/s
- C. 35m/s
- D. 15m/s

35. The circumference of a circular track is 314m. Find the diameter of this track. [Take $\pi = 3.14$]

- A. 0.001m
- B. 1m
- C. 31400m
- D. 100m

36. Lawrence types 435 words in 25 minutes. How many words can she type in 1hour 15minutes?

- A. 1205 words
- B. 1505 words
- C. 1305 words
- D. 1300 words

37. Express 108 as a product of prime factors

- A. 2×3
- B. $2^2 \times 3^3$
- C. $2^3 \times 3^3$
- D. $2^3 \times 3^2$

38. A swivel chair which cost GH¢ 500,000 was sold at a profit of 40%. What was the selling price?

- A. GH¢ 600,000
- B. GH¢ 700,000
- C. GH¢ 300,000
- D. GH¢ 120,000

39. Find the rule of the mapping below;

0	1	2	3
↓	↓	↓	↓
1	2	4	8

- A. $y = 2x+1$
- B. $y = 2x-1$
- C. $y = 2^{x+1}$
- D. $y = 2^x$

40. Given that $a = \frac{hw}{h+w}$, find h if $a = 20$ and $w = 5$.

- A. $-7\frac{2}{3}$
- B. $-8\frac{2}{3}$
- C. $6\frac{2}{3}$
- D. $-6\frac{2}{3}$