

PAPER 1

Answer all questions.

Each question is followed by four options A to D. Find the correct option for each question and shade in pencil on your answer sheet the answer space which bears the same letter as the option you have chosen. Give only one answer to each question.

1. Which of the following is read as 'P is a subset of Q'?

- A. $P \cap Q$
- B. $Q \cup P$
- C. $Q \subset P$
- D. $P \subset Q$

2. Simplify $3\frac{1}{2} + 2\frac{3}{10} - 4\frac{5}{6}$

- A. $1\frac{29}{30}$
- B. $1\frac{4}{30}$
- C. $\frac{1}{30}$
- D. $\frac{29}{30}$

3. Simplify $13 - (13 - 5) + 6$

- A. 21
- B. -14
- C. 11
- D. 16

4. Write 0.875 as a fraction in its lowest term.

- A. $\frac{7}{8}$
- B. $\frac{5}{8}$
- C. $\frac{5}{7}$
- D. $\frac{1}{16}$

5. What is the value of 5 in the figure 4053.07?

- A. Five tenths
- B. Five
- C. Fifty
- D. Five thousand

6. Which is the largest of these

fractions $\frac{4}{15}, \frac{5}{12}, \frac{2}{5}, \frac{1}{3}$?

- A. $\frac{4}{15}$
- B. $\frac{5}{12}$
- C. $\frac{2}{5}$
- D. $\frac{1}{3}$

7. Find all the integers in the interval $8 < x < 12$.

- A. {8,9,10,11}
- B. {8,9,10,11,12}
- C. {9,10,11}
- D. {9,10,11,12}

8. Given that $14 \times 1.76 = 24.64$, find 1.4×1.76 .

- A. 24.64
- B. 2.464
- C. 0.2464
- D. 0.0246

9. Find the number whose prime factors are $2^2 \times 3^2 \times 5$.

- A. 60
- B. 90
- C. 150
- D. 180

10. Which the following is not true about square?

- A. The two pairs of opposite sides are parallel.
- B. The diagonals are equal.
- C. The diagonals cut at 45° .
- D. Each of the interior angles is 90° .

11. A point P(4,5) is rotated through an angle 90° clockwise about the origin Find the

coordinates of the image P_1 of the rotation.

- A. (4, -5)
- B. (-5, -4)
- C. (5, -4)
- D. (-4, -5)

12. Expand $(3x - y)(x + y)$

- A. $3x^2 + 2xy - y^2$
- B. $3x^2 + 3xy - y^2$
- C. $3x^2 - 2xy + y^2$
- D. $3x^2 - 2xy - y^2$

13. The volume of a box of length 10m and width 12m is 960m^3 . What is the height of the box?

- A. 8m
- B. 22m
- C. 43m
- D. 80m

14. If $a = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$ and $b = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$. Find

- $a + b$
- A. $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$
- B. $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$
- C. $\begin{pmatrix} 4 \\ 9 \end{pmatrix}$
- D. $\begin{pmatrix} 4 \\ 1 \end{pmatrix}$

15. Which of these solids cannot have a rectangle in its net?

- A. Cylinder
- B. Hexagon
- C. Tetrahedron
- D. Triangular prism

16. R is the point (0,3) and S is the point (3,1). Calculate the gradient of the straight line RS.

- A. $\frac{2}{3}$
- B. $\frac{3}{2}$
- C. $-\frac{2}{3}$

~~D. $-\frac{3}{2}$~~

17. Find the total length of the edges of a cube if the volume is 64cm^3 .

- A. 4cm
- B. 16cm
- C. 24cm
- D. 48cm

18. What is the simple interest on GHC250,000.00 for 15 months at 3% per annum?

- A. GHC112,500.00
- B. GHC18,750.00
- C. GHC9,375.00
- D. GHC4,687.00

19. The ratio of private cars to taxis in a parking lot is 7: 2. If there are 35 private cars, how many taxis are there?

- A. 10
- B. 15
- C. 12
- D. 14

20. Simplify $0.0864 \div 0.004$.

- A. 2160
- B. 21.6
- C. 216
- D. 2.16

21. Simplify $(12ab + 8bc) \div 4b$

- A. $3a + c$
- B. $a + 2c$
- C. $3ab + 2bc$
- D. $3a + 2c$

22. If $y = 2$ satisfies the equation $1.3 - ky = 0.2y + 0.3$, find the value of k.

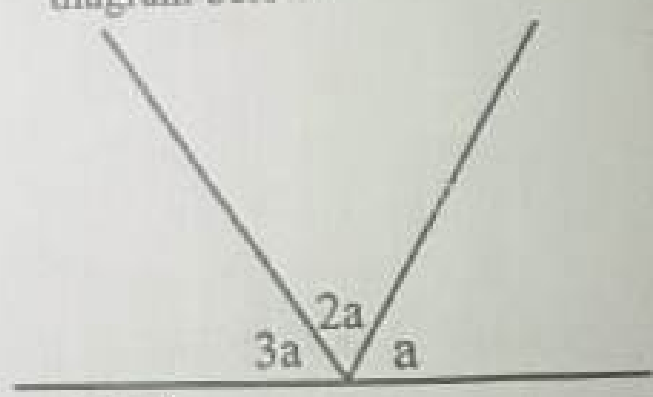
- A. 0.1
- B. 0.2

23. If $b^2 + 2 = 51$. Find b .
- A. 49
 B. 7
 C. 17
 D. 53
24. A bag contains 8 blue and 4 red balls. What is the probability of picking a blue ball at random from the bag?
- A. $\frac{1}{3}$
 B. $\frac{1}{2}$
 C. $\frac{2}{3}$
 D. $\frac{3}{4}$
25. Correct 0.0003841 to one significant figure.
- A. 0.0003
 B. 0.004
 C. 0.003
 D. 0.0004
26. In an examination, 40% of the students passed. The number of students that failed was 180. How many students passed?
- A. 120
 B. 270
 C. 300
 D. 450
27. Find the L.C.M of 10, 15 and 35.
- A. 210
 B. 180
 C. 150
 D. 120

28. In what time will C750,000.00 amount to C 800,000.00 at 5% per annum simple interest.
- A. $1\frac{1}{3}$ years
 B. $1\frac{1}{2}$ years
 C. $2\frac{1}{4}$ years
 D. $2\frac{1}{8}$ years

29. How many sides has a regular polygon if each interior angle is 162° ?
- A. 14
 B. 16
 C. 18
 D. 20

30. Find the value of a in the diagram below.



- A. 20°
 B. 30°
 C. 15°
 D. 25°
31. Find the truth set of $\frac{1}{2x} - \frac{1}{3} \leq \frac{1}{2}$
- A. $\{x : x \leq \frac{1}{2}\}$
 B. $\{x : x \geq \frac{3}{5}\}$
 C. $\{x : x \leq \frac{3}{5}\}$
 D. $\{x : x \geq \frac{1}{2}\}$

32. What is the square root of

$$1\frac{1}{25}?$$

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

33. The sum of two consecutive odd numbers is 20. Find their product.

- A. 88
- B. 65
- C. 55
- D. 99

34. Find the image of -4 in the relation $y \rightarrow 2x - 1$

- A. 9
- B. -6
- C. -9
- D. 6

35. Find the number that can be added to 77 to make it supplementary angle.

- A. 13°
- B. 48°
- C. 103°
- D. 63°

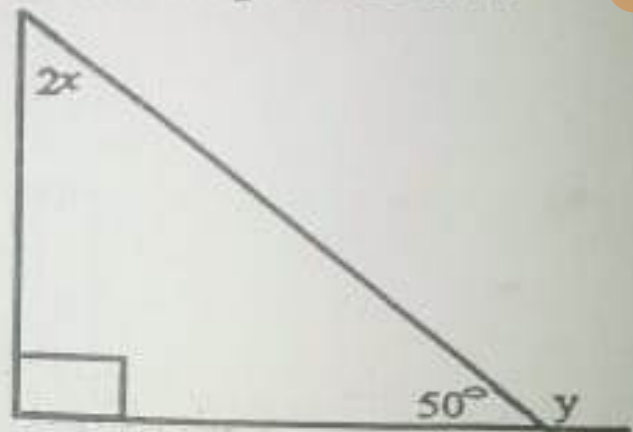
36. Write 74300 in standard form.

- A. 7.43×10^4
- B. 7.43×10^{-4}
- C. 7.43×10^5
- D. 7.43×10^6

37. Express $3\frac{1}{3} - 2\frac{1}{2}$ in lowest form

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

Calculate the value of x in the diagram below.



38. The value of x is

- A. 40°
- B. 140°
- C. 50°
- D. 20°

39. Solve $2^2 - 3^3 + 9^2$

- A. 13
- B. 24
- C. 48
- D. 58

40. If 80 is divided by the sum of (2 and x), if the result is 20, find the value of x .

- A. 10
- B. 8
- C. 6
- D. 2

PAPER 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. a. In a class of 50 students, 60% of them like commerce. 50% of those who like commerce like Geography. In the class, none of the students like both subjects and again, not all of them prefer any of the two subjects. Use the above information to answer the questions below.

- i. Draw a Venn Diagram to represent the above information.
- ii. Find the number of students that prefer,
 - a) only subject
 - β) none of the two subjects

iii. If a student is chosen at random, what is the probability that he/she prefers commerce or geography?

b. Simplify
$$\frac{\frac{1}{4} \times \frac{1}{2} + \frac{1}{8} + \frac{3}{8}}{\frac{2}{21} - \frac{1}{7}}$$

c. Make x the subject in the expression $\sqrt{\frac{3}{2x-1}} = 1\frac{1}{2}$

2. The operation Δ is defined on the set of real numbers by $m \Delta n = m + n + 10$.

Evaluate

- i. $8 \Delta 2$
- ii. $3 \Delta (4 \Delta 5)$

b. Copy and Complete the table for the values of relations $y_1 = 3 - 2x$ and $y_2 = -2x + 5$ for x ranges from -4 to 3.

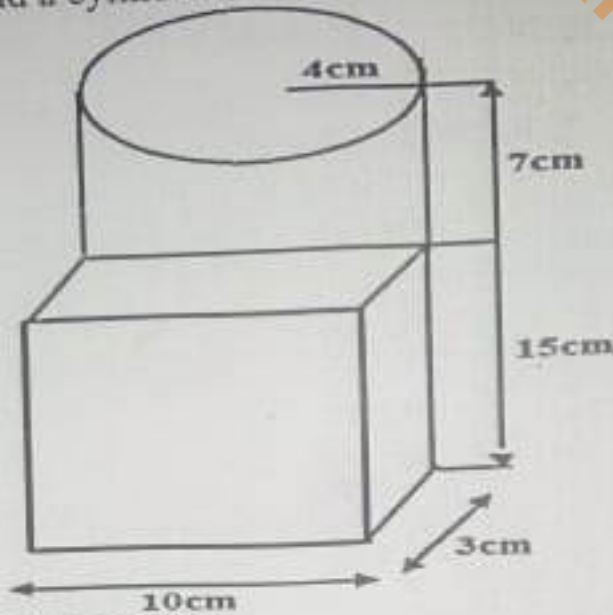
x	-4	-3	-2	-1	0	1	2	3
$y_1 = 3 - 2x$	11	9	7	5	3	1	-1	-3
$y_2 = -2x + 5$								

- i. Using a scale of 2cm to 2units on y axis, draw on a graph sheet two perpendicular axes, Ox and Oy .
- ii. On the same graph sheet, draw the graphs of relations of $y_1 = 3 - 2x$ and $y_2 = -2x + 5$.
- iii. Find the coordinates of the point of intersection of y_1 and y_2 .

c. Make ' U ' the subject of $2(U - 3m) = U + m$

ii. inverse of the mapping.

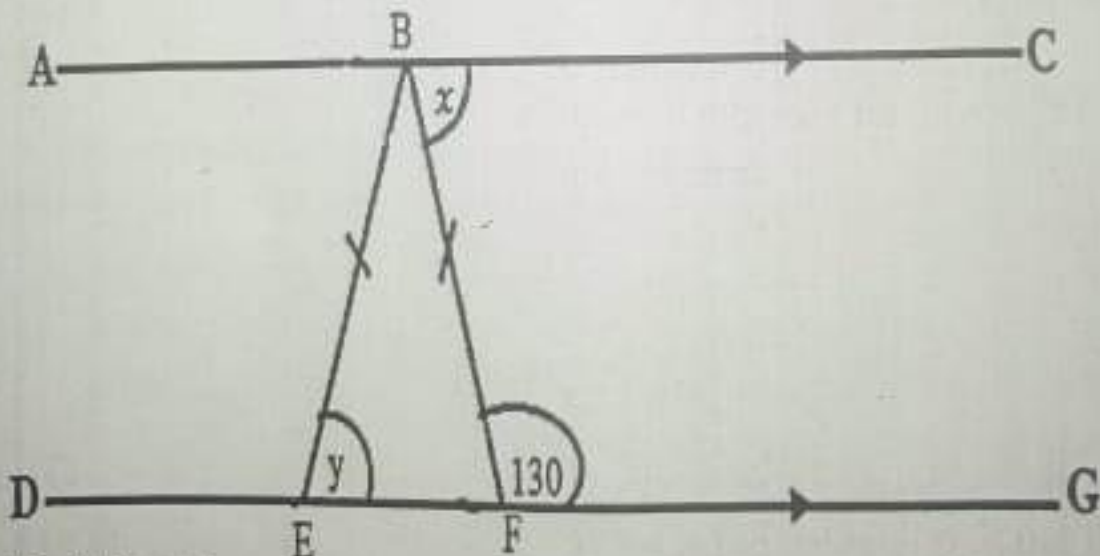
6. The diagram below is made of rectangular metal box with dimensions 10cm by 3cm by 15cm and a cylindrical metal container of radius 4cm and height 7cm.



Calculate the volume of the;

- Cylindrical metal container.
- Rectangular metal box.
- Solid.

b. In the diagram below, AC is parallel to DG and angle $BFG = 130^\circ$



Find the value of;

- Angle of ABE
- x
- y