

## MATHEMATICS 2

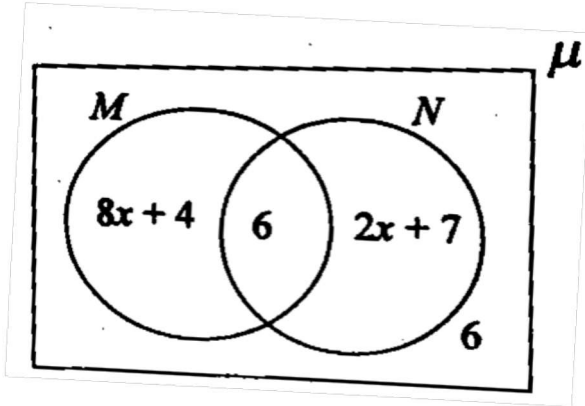
### ESSAY

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.



In the Venn diagram, M and N are intersecting sets in the universal set  $\mu$ .

(a) Express  $n(M)$  and  $n(N)$  in terms of  $x$ .

(b) Given that  $n(M) = n(N)$ , find the:

i. value of  $x$ ;

ii.  $n(\mu)$ .

(c) Simplify:  $2^6 \div (2^2 \times 2^1) \div 2^5$ .

2. (a) Factorize the expression  $5ay - by + 15a - 3b$ .

(b) Solve  $\frac{6}{4p-1} = \frac{4}{3(p+4)}$ .

(c) Esi and Kofi shared an amount of GHC 21,00.00 in the ratio 2:5 respectively. How much more did Kofi receive than Esi?

3. (a) If  $r = \begin{pmatrix} -4 \\ -5 \end{pmatrix}$  and  $m = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$ , find  $p$  given that  $p = r - m$ .

(b) The sum of two numbers is 81. If the second number is twice the first, find the second number.

(c) The floor of a rectangular hall is of length of 9 m and width of 4 m. How many tiles of 20 cm by 30 cm can be used to cover the floor completely.

4. (a) Antwiwaa bought 25 mangoes, 7 of which were unripe. What percentage of the mangoes were ripe?

(b)

$x$	1	2	3	4	...	8	...	$n$
$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$		$\downarrow$		$\downarrow$
$y$	-1	2	5	8		$m$		29

The mapping shows the relationship between  $x$  and  $y$ . Find the:

(i) rule of the mapping;

(ii) values of  $m$  and  $n$ .

(c) A bus left town **X** at 6:30 am and arrived at town **Y** at 1:00 pm. If the bus travelled at an average speed of 100km per hour, calculate the distance from town **X** to town **Y**.

5. (a) Simplify:  $4x + 2)(x - 2) - 3x^2$ .

(b) The following are the angles formed at the centre of a circle:  $40^\circ, 60^\circ, 100^\circ, 3x^\circ$  and  $5x^\circ$ . Find the value of  $x$ .

(c) The cost ( $C$ ) in Ghana Cedis of producing a book of  $x$  pages is given by  $C = 25 + 0.6x$ .

(i) Find the cost of producing a book with 220 pages.

(ii) How many pages are in a book produced at a cost of GHC 145.00?

6. The table shows the number of marbles students sent to class for Mathematics lesson.

<i>Number of Marbles (<math>x</math>)</i>	<i>Number of Students (<math>f</math>)</i>	<i><math>fx</math></i>
1	4	-
2	5	-
3	-	42
4	9	-
5	-	3-
6	2	12

(a) Copy and complete the table.

(b) How many:

(i) students were in the class?

(ii) marbles were brought altogether?

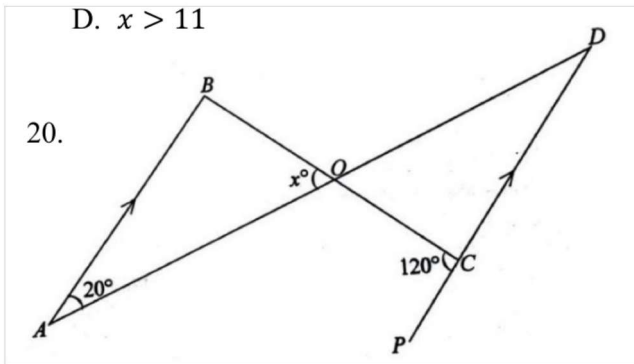
(iii) marbles did **most** of the students bring?

(c) Calculate, correct to the **nearest** whole number, the mean number of marbles brought for the lesson.

**END OF ESSAY TEST**



- C.  $y = 4x + 1$   
 D.  $y = 5x + 1$
16. Find  $x$  when  $y = 37$ .  
 A. 6  
 B. 7  
 C. 8  
 D. 9
17. If  $P = \{4, 8, 12, 16, 20\}$ ,  $Q = \{16, 4, 12, k, 20\}$  and  $P = Q$ , find the value of  $k$ .  
 A. 20  
 B. 16  
 C. 8  
 D. 4
18. The area of a trapezium is  $36 \text{ cm}^2$   
 A. 1.0 cm  
 B. 1.8 cm  
 C. 3.2 cm  
 D. 3.6 cm
19. Solve:  $(1 - x) \div 2 < 4$ .  
 A.  $x < -11$   
 B.  $x > -11$   
 C.  $x < 11$   
 D.  $x > 11$



**NOT DRAWN TO SCALE**

In the diagram, line  $AB$  is parallel to line  $PD$ .  
 Find the value of  $x$ .

- A.  $20^\circ$   
 B.  $80^\circ$   
 C.  $100^\circ$   
 D.  $120^\circ$
21. If  $2x - 1 = 5$ , find the value of  $x$ .  
 A. 3  
 B. 4  
 C. 5  
 D. 6
22. Esi bought a television set of GHC 1, 500.00.  
 If she sold it at a profit of 20%, find the selling price.  
 A. GHC 1,200.00  
 B. GHC 1,500.00  
 C. GHC 1,750.00  
 D. GHC 1,800.00
23. On a map,  $\frac{1}{3}$  cm represents 5 km. If two towns  $A$  and  $B$  are 18 cm apart on the map, what is the actual distance between them?  
 A. 27 km  
 B. 30 km  
 C. 240 km  
 D. 270 km
24. If the average of 5, 6, 7 and  $x$  is 8, find the value of  $x$ .  
 A. 12  
 B. 14  
 C. 16  
 D. 24
25. Factorize:  $3ax + 6a - x - 2$ .  
 A.  $(3a + 1)(x + 2)$   
 B.  $(3a + 1)(x - 2)$   
 C.  $3a(x - 2)$   
 D.  $(3a - 1)(x + 2)$
26. Kofi and Ama shared an amount of GHC 3, 000.00 in the ration 2:3. Find the amount received by Kofi.  
 A. GHC 1, 000.00  
 B. GHC 1, 200.00  
 C. GHC 1, 500.00  
 D. GHC 1, 800.00
27. The image  $P(10, -3)$  when translated by the vector  $\mathbf{r}$  is  $P'(4, 5)$ . Find  $\mathbf{r}$ .  
 A.  $\begin{pmatrix} 14 \\ 2 \end{pmatrix}$   
 B.  $\begin{pmatrix} 6 \\ -8 \end{pmatrix}$   
 C.  $\begin{pmatrix} -6 \\ 8 \end{pmatrix}$   
 D.  $\begin{pmatrix} 6 \\ 8 \end{pmatrix}$
28. Find the gradient of the line that joins the points  $A(-3, 5)$  and  $B(7, -2)$ .  
 A.  $\frac{10}{7}$   
 B.  $-\frac{5}{12}$   
 C.  $-\frac{7}{10}$   
 D.  $\frac{12}{5}$

29. Simplify  $3y - \frac{(2y-3)}{4}$ .
- $10y + 3$
  - $10y - 3$
  - $\frac{10y-3}{4}$
  - $\frac{10y+3}{4}$
30. Divide 0.5445 by 0.09
- 5.05
  - 6.05
  - 6.50
  - 60.5
31. The area of a rectangle is  $18 \text{ cm}^2$ . If one of its sides is 2 cm long, find its perimeter.
- 18 cm
  - 20 cm
  - 22 cm
  - 36 cm
32. A trader bought 100 tubers of yam for GHC  $n$  each. All the yams were sold at GHC  $m$  each. Find the profit.
- GHC  $100(m - n)$
  - GHC  $100(m + n)$
  - GHC  $100(n - m)$
  - GHC  $100(nm)$
33. Find the simple interest on GHC 600.00 which was saved for 8 months at 5% per annum.
- GHC 20.00
  - GHC 40.00
  - GHC 45.00
  - GHC 240.00
34. If the median of the numbers 9, 10, 12,  $x$ , 20 and 25 is 14, find the value of  $x$ .
- 14
  - 16
  - 18
  - 22
35. What is the Highest Common Factor (HCF) of 24, 32 and 64?
- 4
  - 6
  - 8
  - 16
36. A car covered a distance of 150 km at a speed of 18 km/h. Find the time taken.
- 7 hours 33 minutes
  - 7 hours 53 minutes
  - 8 hours 13 minutes
  - 8 hours 20 minutes
37. Express 134.78 correct to the **nearest** tenth.
- 130.0
  - 134.7
  - 134.8
  - 135.0
38. Expand  $(7r - 5)(3r + 4)$ .
- $21r^2 + 13r - 20$
  - $21r^2 - 13r - 20$
  - $21r^2 - 43r - 20$
  - $21r^2 + 43r - 20$
39. An amount of GHC 375, 000.00 was needed to build a clinic for a community of twelve towns. Each community contributed GHC 25, 000.00. If the District Assembly also contributed GHC 30, 500.00, how much more is needed to build the clinic?
- GHC 44, 500.00
  - GHC 45, 500.00
  - GHC 34, 500.00
  - GHC 75, 000.00
40. A box can take 12 pencils. If 156 pencils are packed into such boxes, how many boxes will be fully packed?
- 10
  - 11
  - 12
  - 13