

**2011 BECE MATHEMATICS 1**  
**MATHEMATICS 1**

OBJECTIVE TEST

1 hour

1. Which of the following is the set of prime factors of 12?
  - A. {2, 3}
  - B. {1, 2, 3}
  - C. {1, 2, 4, 6}
  - D. {2, 3, 4, 6}
  
2. Expand  $3a(a - 4b)$ 
  - A.  $3a - 12ab$
  - B.  $3a^2 - 12ab$
  - C.  $3a^2 - 12b$
  - D.  $3a^2 - 12a$
  
3. Express 5 as a percentage of 4
  - A. 125%
  - B. 120%
  - C. 25%
  - D. 20%
  
4. Express 2700 as a product of prime numbers.
  - A.  $2^2 \times 3^2 \times 5^2$
  - B.  $2 \times 3^3 \times 5^2$
  - C.  $2^2 \times 3^3 \times 5^2$
  - D.  $2 \times 3^2 \times 5^3$
  
5. The ratio of mangoes to oranges in a basket is 3:2. If there are 36 mangoes, how many oranges are in the basket?
  - A. 90
  - B. 60
  - C. 24
  - D. 12
  
6. Express 0.125 as a fraction in its lowest form.
  - A.  $\frac{1}{8}$
  - B.  $\frac{1}{9}$
  - C.  $\frac{1}{12}$
  - D.  $\frac{1}{16}$
  
7. Convert  $222_{\text{five}}$  to a number in base ten.
  - A. 30
  - B. 52
  - C. 60
  - D. 62
  
8. If  $A = \{18, 19, 20\}$  and  $B = \{15, 16, 17\}$ , find  $A \cap B$ 
  - A.  $\{15, 16, 17, 18, 19, 20\}$

- B. {15, 16, 18, 19}
- C. {18, 19}
- D. {}

9. Simplify  $3^9 \div 3^3$

- A.  $3^{27}$
- B.  $3^{12}$
- C.  $3^6$
- D.  $3^3$

10. An article which costs GH¢ 25.00 was sold for GH¢ 35.00. Find the percentage profit made.

- A. 10%
- B. 28%
- C. 40%
- D. 70%

11. Factorize completely  $b^2 + fb - mb - fm$

- A.  $(b - f)(b - m)$
- B.  $(b + f)(b - m)$
- C.  $(b + f)(m - b)$
- D.  $(b + f)(m + b)$

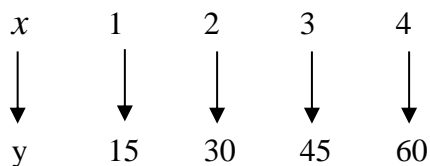
12. Simplify:  $-13 - (-3) + (-10)$

- A. -26
- B. -20
- C. -10
- D. -6

13. Find the HCF of  $3^3 \times 5^2$  and  $3^2 \times 5^4$

- A.  $3^2 \times 5^2$
- B.  $3^3 \times 5^2$
- C.  $3^2 \times 5^4$
- D.  $3^5 \times 5^6$

14. State the rule for the mapping



- A.  $x \rightarrow 15x$
- B.  $x \rightarrow 15 + x$
- C.  $x \rightarrow \frac{15}{x}$
- D.  $x \rightarrow 10 + 5x$

15. Solve the inequality  $x - \frac{1}{3} \geq \frac{2}{3} - x$

- A.  $x \leq \frac{1}{2}$

- B.  $x \leq \frac{2}{3}$   
 C.  $x \geq \frac{1}{2}$   
 D.  $x \geq \frac{2}{3}$

16. Find the area of a square, if its perimeter is 28 cm.

- A.  $784 \text{ cm}^2$   
 B.  $196 \text{ cm}^2$   
 C.  $49 \text{ cm}^2$   
 D.  $14 \text{ cm}^2$

17. Simplify:  $\frac{1}{3}\left(\frac{1}{2} - \frac{1}{3}\right) - \frac{1}{3}\left(\frac{1}{3} - \frac{1}{2}\right)$

- A.  $-\frac{1}{9}$   
 B.  $-\frac{1}{18}$   
 C.  $\frac{1}{18}$   
 D.  $\frac{1}{9}$

18. Make  $n$  the subject of the relation  $\theta = 180 - \frac{360}{n}$

- A.  $\frac{\theta+180}{2}$   
 B.  $\frac{\theta-180}{2}$   
 C.  $\frac{360}{180-\theta}$   
 D.  $\frac{360}{180+\theta}$

19. If  $R = \frac{h}{2} + \frac{d^2}{8h}$ , find  $R$  when  $d = 8$  and  $h = 6$ .

- A.  $3\frac{1}{6}$   
 B.  $4\frac{1}{3}$   
 C.  $4\frac{3}{4}$   
 D.  $4\frac{9}{16}$

20. Eight copies of a book cost GH¢ 16.00. Find the cost of 5 copies.

- A. GH¢ 2.00  
 B. GH¢ 3.20  
 C. GH¢ 5.00  
 D. GH¢ 10.00

21. Solve the equation  $\frac{1}{5}(2 + y) = \frac{1}{2}(y - 1)$

- A. -3

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

22. The gradient of the straight line that passes through points A(3,2) and B(4,8) is

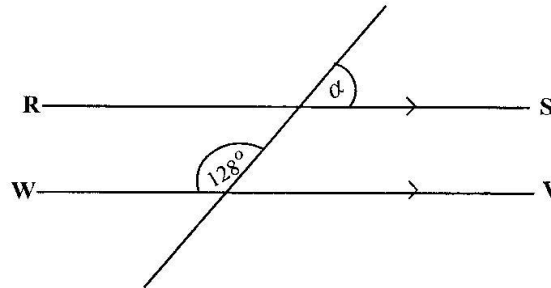
- A.  $-\frac{1}{6}$
- B.  $-\frac{1}{2}$
- C. 2
- D. 6

23. A car is travelling at 60 km per hour. How far does it travel in  $2\frac{1}{2}$  hours?

- A. 30 km
- B. 60 km
- C. 120 km
- D. 150 km

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

- A.  $38^\circ$
- B.  $52^\circ$
- C.  $58^\circ$
- D.  $64^\circ$



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25. Given that  $\mathbf{a} = \begin{pmatrix} 5 \\ 2n \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 2n-1 \\ 6 \end{pmatrix}$ . If  $\mathbf{a} = \mathbf{b}$ , find the values of  $n$ .

- A. 6
- B. 3
- C. 2
- D. 1

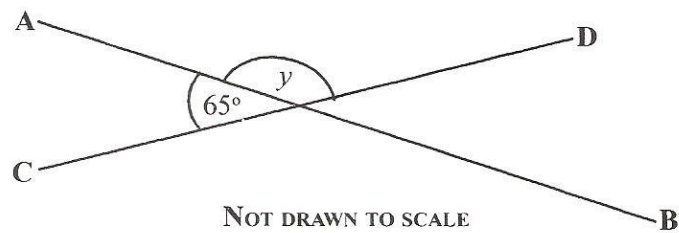
26. Find the volume of a cube of side 5 cm.

- A.  $10 \text{ cm}^3$
- B.  $15 \text{ cm}^3$
- C.  $25 \text{ cm}^3$
- D.  $125 \text{ cm}^3$

27. In the diagram below, **AB** and **CD** are two intersecting straight lines. Find the value of the angle marked  $y$ .

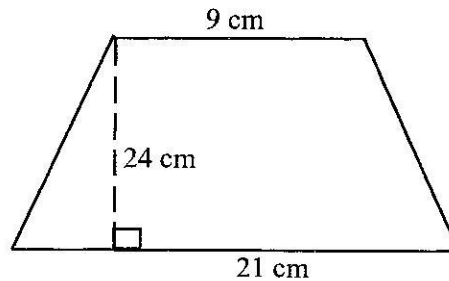
- A.  $130^\circ$
- B.  $115^\circ$

- C.  $65^\circ$
- D.  $60^\circ$



28. Kwame and Ama shared an amount of money in the ratio 5:4 respectively. If Kwame had GH¢ 9.00, how much did they share?
- A. GH¢ 16.20
  - B. GH¢ 36.00
  - C. GH¢ 45.00
  - D. GH¢ 81.00

29.



The area of the trapezium above is

- A.  $120 \text{ cm}^2$
  - B.  $180 \text{ cm}^2$
  - C.  $256 \text{ cm}^2$
  - D.  $360 \text{ cm}^2$
30. If  $r = \begin{pmatrix} 2 \\ -5 \end{pmatrix}$  and  $s = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ , calculate  $2r - 3s$
- A.  $\begin{pmatrix} -10 \\ -25 \end{pmatrix}$
  - B.  $\begin{pmatrix} -2 \\ -25 \end{pmatrix}$
  - C.  $\begin{pmatrix} 10 \\ -25 \end{pmatrix}$
  - D.  $\begin{pmatrix} 10 \\ 25 \end{pmatrix}$
31. There are 10 red and 15 green balls in a bag. Find the probability of selecting at random a red ball from the bag.
- A.  $\frac{3}{5}$
  - B.  $\frac{2}{5}$
  - C.  $\frac{1}{10}$
  - D.  $\frac{1}{25}$

The table below gives the distribution of ages of students in a class. Use it to answer Questions 32 – 34

Ages (years)	13	14	15	16	17
Number of students	3	10	6	7	4

32. How many students are in the class?

- A. 20
- B. 30
- C. 45
- D. 75

33. What is the modal age?

- A. 14
- B. 15
- C. 16
- D. 17

34. If a student is chosen at random from the class, what is the probability that the student is 15 years old?

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

35. A length of a ribbon is 16.8 m long. How many ribbons 0.36 m long can be cut from it?

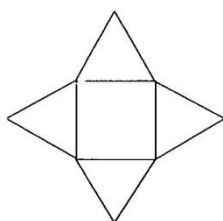
- A. 0.46
- B. 4.60
- C. 46
- D. 460

36. A refrigerator was sold for GH¢ 200.00 at a loss of 10%. Find the cost price.

- A. GH¢ 180.00
- B. GH¢ 190.00
- C. GH¢ 220.00
- D. GH¢ 222.22

37. The diagram below is the net of a

- A. cone
- B. cuboid
- C. rectangular prism
- D. pyramid



38. What is the value of 7 in the number 832713?

- A. Seven thousand
- B. Seven hundred
- C. Seventy
- D. Seven

**39.** Write 3560 in standard form.

- A.  $3.56 \times 10^{-4}$
- B.  $3.56 \times 10^{-3}$
- C.  $3.56 \times 10^3$
- D.  $3.56 \times 10^4$

**40.** Correct 0.02751 to three decimal places

- A. 0.027
- B. 0.028
- C. 0.03
- D. 0.28