

TEACHERS COLLEGES OF JAMAICA

BACHELLOR OF EDUCATION

DECEMBER 2018 EXAMINATIONS

COMMON PAPER

MATHEMATICS

FOUNDATION CONCEPTS IN MATHEMATICS 1

[MT0001]

**YEAR 1
SECONDARY**

TIME: 2 HOURS

INSTRUCTIONS: Candidates are required to answer **ALL** questions in Sections A and B.

Write **ALL** answers in the answer booklet.

Where a numerical result is not exact, give your answer correct to three significant figures if the degree of accuracy is not stated, and solution is not the size of an angle.

Electronic calculators are allowed.

Graphic calculators are prohibited.

Show all workings.

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

SECTION A

Answer **ALL** questions in this section.

[25 marks]

1. All the elements outside of a set are called the set's
 - a. subset.
 - b. union.
 - c. complement.
 - d. intersection.

2. Simplify $16x / 4x$.
 - a. 4.
 - b. $4x$.
 - c. 12.
 - d. $12x$.

3. If set $A = \{a, b, c, d\}$ then set A has
 - a. 24 subsets.
 - b. 8 subsets.
 - c. 16 subsets.
 - d. 9 subsets.

4. What is the highest common factor of 12 and 24?
 - a. 6
 - b. 3
 - c. 12
 - d. 2

5. If $3^x = 24$, then the value of $x =$
 - a. 64.
 - b. $3/24$.
 - c. 12.
 - d. 8.

6. $9^0 =$
 - a. 0.
 - b. 1.
 - c. 9.
 - d. $0/9$.

7. A set which is contained in another set is called a
- subset.
 - open set.
 - infinite set.
 - universal set.
8. $C = \{\text{odd numbers between 2 and 16}\}$
- $\{2,3,5,7,9,11,13,15\}$
 - $\{5,7,9,11,13,15\}$
 - $\{3,5,7,9,11,13,15\}$
 - $\{2,3,5,7,9,11,13,15,16\}$
9. If $Y = \frac{W^2}{5-W}$ find Y when $w = -2$
- $4/7$
 - $-4/7$
 - $4/-7$
 - $4/3$
10. Solve for x if $3(x - 4) = 36$.
- 12
 - 6
 - 16
 - 48
11. Given that $a = 3$, $b = 2$ and $c = 5$, evaluate $3a - 2b + 5c$.
- 30
 - 25
 - 10
 - 35
12. $(x^3)^6$
- x^{18}
 - $x^{3/6}$
 - $x^{6/3}$
 - x^9

13. If 30% of a number is 90, then the number is
- 30.
 - 300.
 - 2700.
 - 400.
14. Simplify $5(x + 3) - 2(x - 4)$.
- $5x - 12$
 - $3x + 12$
 - $3x + 23$
 - $7x - 9$
15. The number 68677 written correctly to 4 significant numbers is
- 68680.
 - 6868.
 - 68700.
 - 69000.
16. The number of significant figures in 0.0785 are
- 4 significant figures.
 - 5 significant figures.
 - No significant figures.
 - 3 significant figures.
17. \$400 is divided among three (3) friends in the ratio 1:2:5. The largest share is
- \$500.
 - \$1000.
 - \$250.
 - 4750.
18. $y^{-8} \times y^6 =$
- y^{-14}
 - y^{-2}
 - $y^{-8/6}$
 - y^2
19. The sum of four times p and five times q is
- $4p + 5q$.
 - $20 pq$.
 - $20(p + q)$.
 - $9pq$.

20. Simplify the following leaving your answer in index form: $2 \times 2 \times 4 \times 5 \times 5$
- $4^2 \times 5^2$
 - 16×5^2
 - $2^4 \times 5^2$
 - $2^2 \times 4 \times 5^2$
21. x^9 divide by x^4 gives
- x^{13}
 - $x^{9/4}$
 - x^5
 - $x^{4/9}$
22. $(-5b)(-4a) =$
- $-20ba$
 - $-9ba$
 - $9ba$
 - $20ba$
23. If $a = -12$ and $b = -5$, then $b \times a =$
- -60
 - 17
 - -17
 - 60
24. The set of numbers greater than or equal -6 but less than or equal to 6 can be denoted as
- $\{x: -6 \leq x > 6\}$
 - $\{x: -6 < x > 6\}$
 - $\{x: -6 \leq x \leq 6\}$
 - $\{x: -6 \geq x \geq\}$
25. If A and B represent integers, $A \times B = B \times A$ represents which property?
- Identity
 - Commutative
 - Distributive
 - Associative

26. Robert is x years younger than Rita. If Rita is 25 years old, then Robert's age in years is?
- $25 - x$
 - $x - 25$
 - $x + 25$
 - $\frac{25x}{2}$
27. Find the value of $\frac{2}{5} + \frac{2}{3} \times \frac{1}{3}$.
- $\frac{28}{45}$
 - $\frac{4}{15}$
 - $\frac{4}{5}$
 - $\frac{4}{5}$
28. Which of the following illustrates the set of rational numbers?
- $\{0, 1, 2, 3, \dots\}$
 - $\{\sqrt{0.25}, 2, \frac{1}{2}, .25, 1/3, \dots\}$.
 - $\{1, 3, 5, 7, \dots\}$
 - $\{\sqrt{8}, -\sqrt{11}, \sqrt{2}, \dots\}$.
29. Which number is a multiple of 4?
- 2
 - 14
 - 10
 - 16
30. Which property is illustrated by the statement: $(5 \times 6) \times 1 = 30$?
- Associative property for multiplication
 - Unit property for multiplication
 - Identity property for multiplication
 - Communicative property for multiplication

4. Sue is 'x' years old, her father Tom is three (3) times her age and her mother Mary is two (2) years younger than her father.

a) Write an algebraic expression for Mary's age. [2 marks]

b) If the sum of their age is 103, determine Mary's age. [3 marks]

5. Solve the following equations:

a) $5x - 3 = 3x + 11$ [2 marks]

b) $\frac{2x-1}{5} = \frac{5x-11}{4}$ [3 marks]

6. By showing all the different steps that are involved, find the value of:

a) $16 \div 4 \times 3 + (10 - 3)$ [2 marks]

b) Calculate the exact value of:

$$\frac{5\frac{3}{5} - 3\frac{1}{2} \times \frac{2}{3}}{2\frac{1}{3}} \quad [3 \text{ marks}]$$

7. Calculate 3.15×7.23 and write your answer

a) exactly, [2 marks]

b) correct to 2 decimal places, [1 mark]

c) correct to 2 significant figures, [1 mark]

d) in standard form. [1 mark]

8. Simplify the following expressions:

a) $4x - 3(x + 3)$ [1 mark]

b) $\frac{3^4 \times 5^3 \times 7^2}{3^2 \times 5^2 \times 7}$ [2 marks]

c) $5(x + y) - (5x - 3y) + 2(2x + y)$ [2 marks]

9. Given that $a = -2$, $b = 4$ and $c = -5$, evaluate

a) $(c + b)c$ [1 mark]

b) $2a - 3c$ [1 mark]

c) $4(c-a) \div (b-a)$ [2 marks]

10. State whether the following statements are TRUE or FALSE

a) 5.5 is a whole number

b) 2 is a prime number and an even number

c) 0 is the first whole number

d) 4 is an integer

e) 2,3,5,7,9,11 are all prime numbers

[6 marks each]

[Total = 80 marks]

END OF EXAMINATION

