Unit 1 - Foundations of Algebra Test

Evaluate the expression when \( x = 3, y = 4 \) and \( z = 5 \).

1. \( x + 5y^2 \)
2. \( 9z + 7y - 2 \)
3. \( (4x + 5y) \div 7 \)
4. \( 4x^3 + 5z \)
5. \( \frac{5z}{y} \)
6. \( x^4 - 2(y - 4) \)
7. \( 8 - (-5) + 2x \)
8. \( |-5| - 9x + 2 \)
9. \( -8y^2 + 9z + 4 \)

Simplify each expression.

10. \( (-x)^3(2)^2 \)
11. \( 8(x - 4) \)
12. \( (6 - y)(12) \)
13. \( -11(x + 7) \)
14. \( 5(3 - x) + x \)
15. \( 2x + 5(5 - 14x) \)

Tell whether the given equation has the ordered pair as a solution.

16. \( y - 2x = 6 \) \((2, 13)\)
17. \( y = 2x - 3 \) \((2, 1)\)
18. \( x + 3 = y - 7 \) \((3, 12)\)
19. \( 3x - 1 = 8y \) \((4, 1)\)
Write each algebraic expression.

20. The ratio of sixteen and $x$.

21. The sum of a number $y$ and five is equal to seven.

22. The quotient of $x$ and three is four times the number $y$.

23. Three times the number $x$ is twenty one.

Determine whether the equation is TRUE, FALSE or OPEN. Explain.

24. $(3 \cdot 2)^3 = 3 \cdot 2^3$  
25. $8 - 6 = s - 8$  
26. $8 = y^2 + 3$

27. $\frac{12}{3} = 4$  
28. $9x = x^3$  
29. $38 \cdot 0.1 = 0.38$

Use a table, an equation, and a graph to represent the relationship.

30. Kyle makes 5 baskets every hour.
Evaluate the expression when \( x = 3, y = 4 \) and \( z = 5 \).

1. \( x + 5y^2 = 3 + 5(4^2) = 3 + 5(16) = 3 + 80 = 83 \)
2. \( 9z + 7y - 2 = 9(5) + 7(4) - 2 = 45 + 28 - 2 = 71 \)
3. \( (4x + 5y) ÷ 7 = (4(3) + 5(4)) ÷ 7 = (12 + 20) ÷ 7 = 32 ÷ 7 = \frac{32}{7} \)

4. \( 4x^3 + 5z = 4(3^3) + 5(5) = 4(27) + 25 = 108 + 25 = 133 \)
5. \( \frac{5 - z}{y} = \frac{5 - 5}{4} = \frac{0}{4} = 0 \)
6. \( x^4 - 2(y - 4) = 3^4 - 2(4 - 4) = 81 - 2(0) = 81 \)

7. \( 8 - (-5) + 2x = 8 + 5 + 2(3) = 13 + 6 = 19 \)
8. \( |-5| - 9x + 2 = 5 - 9(3) + 2 = 7 - 27 = -20 \)
9. \( -8y^2 + 9z + 4 = -8(4^2) + 9(5) + 4 = -8(16) + 45 + 4 = -128 + 49 = -79 \)

Simplify each expression.

10. \( (-x)^3(2)^2 = (-x^3)(4) = -4x^3 \)
11. \( 8(x - 4) = 8(x) - 8(4) = 8x - 32 \)
12. \( (6 - y)(12) = 6(12) - y(12) = 72 - 12y \)

13. \( -11(x + 7) = (-11)(x) + (-11)(7) = -11x - 77 \)
14. \( 5(3 - x) + x = 5(3) + 5(-x) + x = 15 - 5x + x = 15 - 4x \)
15. \( 2x + 5(5 - 14x) = 2x + 5(5) + 5(-14x) = 2x + 25 - 70x = 25 - 68x \)

Tell whether the given equation has the ordered pair as a solution.

16. \( y - 2x = 6 \) \( (2, 13) \)
   \( 13 - 2(2) = 6 \)
   \( 13 - 4 = 9 ≠ 6 \)
17. \( y = 2x - 3 \) \( (2, 1) \)
   \( 1 = 2(2) - 3 \)
   \( 1 = 4 - 3 \)
   \( 1 = 1 \)
18. \( x + 3 = y - 7 \) \( (3, 12) \)
   \( 3 + 3 = 12 - 7 \)
   \( 6 ≠ 5 \)
19. \( 3x - 1 = 8y \) \( (4, 1) \)
   \( 3(4) - 1 = 8(1) \)
   \( 12 - 1 = 8 \)
   \( 11 ≠ 8 \)

Write each algebraic expression.

20. The ratio of sixteen and \( x \). \( \frac{16}{x} \)
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21. The sum of a number $y$ and five is equal to seven. 
$$y + 5 = 7$$

22. The quotient of $x$ and three is four times the number $y$. 
$$\frac{x}{3} = 4y$$

23. Three times the number $x$ is twenty one. 
$$3x = 21$$

Determine whether the equation is TRUE, FALSE or OPEN. Explain.

24. $(3 \cdot 2)^3 = 3 \cdot 2^3$ 
$$6^3 = 3 \cdot 8$$
$$216 \neq 24$$
FALSE

25. $8 - 6 = s - 8$ 
Variable $s$
OPEN

26. $8 = y^2 + 3$ 
Variable $y$
OPEN

27. $\frac{12}{3} = 4$ 
$$4 = 4$$
TRUE

28. $9x = x^3$ 
Variable $x$
OPEN

29. $38 \cdot 0.1 = 0.38$ 
$$3.8 \neq 0.38$$
FALSE

Use a table, an equation, and a graph to represent the relationship.

30. Kyle makes 5 baskets every hour.

Where: $p =$ Total number of baskets made 
$t =$ number of hours

$$p = 5(t)$$

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<th>$t$ (hour)</th>
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