**Algebra 2: Real Numbers and Algebraic Expressions**

**Topic A2: Properties of Real Numbers | VERSION A**

Name: _________________________________

Select the property or properties that justifies the following:

1. $9[5 + (-5)] = 9(0)$
   a. Associative
   b. Multiplicative Identity
   c. Distributive
   d. Multiplicative Inverse
   e. Additive Identity
   f. Additive Inverse

2. $6 + 0 = 6$
   a. Commutative
   b. Distributive
   c. Multiplicative Inverse
   d. Additive Identity
   e. Multiplicative Identity
   f. Additive Inverse

Use the associative property to rewrite the following expressions and then simplify the result.

3. $4 + (7 + 5x) =$

4. $7(4a) =$

5. $6 \left( \frac{1}{6} x \right) =$

6. $\frac{8}{7} \left( \frac{7}{8} x \right) =$

7. $5(3y + 4) =$

8. $\frac{1}{3} (15y + 6) =$

9. $2(3x - 4y - 4z) =$

10. $100(0.02x - 0.08y) =$

11. $a \left( 1 + \frac{7}{a} \right) =$
12. $12\left(\frac{1}{4}x - \frac{1}{3}y\right) =$

Use the commutative, associative, and distributive properties to simplify the following.

16. $4a + 3 + 2a + a =$

13. $4(3a - 1) + 4 =$

17. $32\left(\frac{3}{4}\right) - 16\left(\frac{3}{4}\right)^2 =$

Find the LCD and use it to perform the indicated operations.

14. $\frac{11}{30} + \frac{1}{20} =$

18. $7 + 7(4a + 4b) + 3(2a + 5) =$

15. $\frac{17}{77} + \frac{23}{66} =$

19. $4x + 6(x + 2) + 7 =$

20. $6y + 6(6y + 4) + 5 =$
Select the property or properties that justifies the following:

1. \(9[5 + (-5)] = 9(0)\)
   a. Associative
   b. Multiplicative Identity
   c. Distributive
   d. Multiplicative Inverse
   e. Additive Identity
   f. Additive Inverse

2. \(6 + 0 = 6\) d. additive identity
   a. Commutative
   b. Distributive
   c. Multiplicative Inverse
   d. Additive Identity
   e. Multiplicative Identity
   f. Additive Inverse

Use the associative property to rewrite the following expressions and then simplify the result.

3. \(4 + (7 + 5x) = 11 + 5x\)

4. \(7(4a) = 28a\)

5. \(6\left(\frac{1}{6}x\right) = x\)

6. \(\frac{8}{7}\left(\frac{7}{8}x\right) = x\)

7. \(5(3y + 4) = 15y + 20\)

8. \(\frac{1}{3}(15y + 6) = 5y + 2\)

9. \(2(3x - 4y - 4z) = 6x - 8y - 8z\)

10. \(100(0.02x - 0.08y) = 2x - 8y\)

11. \(a\left(1 + \frac{7}{a}\right) = a + 7\)
Name: ________________________________

12. \(12 \left(\frac{1}{4}x - \frac{1}{3}y\right) = 3x - 4y\)

Use the commutative, associative, and distributive properties to simplify the following.

16. \(4a + 3 + 2a + a = 7a + 3\)

13. \(4(3a - 1) + 4 = 12a - 0\)

17. \(32\left(\frac{3}{4}\right) - 16\left(\frac{3}{4}\right)^2 = 15\)

Find the LCD and use it to perform the indicated operations.

14. \(\frac{11}{30} + \frac{1}{20} = \frac{5}{12}\)

18. \(7 + 7(4a + 4b) + 3(2a + 5) = 34a + 28b + 22\)

15. \(\frac{17}{77} + \frac{23}{66} = \frac{263}{462}\)

19. \(4x + 6(x + 2) + 7 = 10x + 19\)

20. \(6y + 6(6y + 4) + 5 = 42y + 29\)