Name_____ Class _____ Date_____

1-4 Practice

Name the property that each statement illustrates.

1. $12 + 917 = 917 + 12$

2. $74.5 \cdot 0 = 0$

3. $35 \cdot x = x \cdot 35$

4. $3 \cdot (-1 \cdot p) = 3 \cdot (-p)$

5. $m + 0 = m$

6. $53.7 \cdot 1 = 53.7$

Use mental math to simplify each expression.

7. $36 + 12 + 4$

8. $19.2 + 0.6 + 12.4 + 0.8$

9. $2 \cdot 16 \cdot 10 \cdot 5$

10. $12 \cdot 18 \cdot 0 \cdot 17$

Simplify each expression. Justify each step.

11. $6 + (8x + 12)$

12. $5(16p)$

13. $(2 + 7m) + 5$

14. $\frac{12st}{4t}$

Tell whether the expressions in each pair are equivalent.

15. $7x$ and $7x \cdot 1$

16. $4 + 6 + x$ and $4 \cdot x \cdot 6$

17. $(12 - 7) + x$ and $5x$

18. $p(4 - 4)$ and 0

19. $\frac{24xy}{2x}$ and $12y$

20. $\frac{27m}{(3+9-12)}$ and $27m$

21. You have prepared 42 mL of distilled water, 18 mL of vinegar and 47 mL of salt water for an experiment.

a. How many milliliters of solution will you have if you first pour the distilled water, then the salt water, and finally the vinegar into your beaker?

b. How many milliliters of solution will you have if you first pour the salt water, then the vinegar, and finally the distilled water into your beaker?

c. Explain why the amounts described in parts (a) and (b) are equal.

Name_____ Class_____ Date_____

1-4 Practice (continued)

Use deductive reasoning to tell whether each statement is *true* or *false*. If it is false, give a counterexample.

22. For all real numbers a and b, $a - b = -b + a$.

23. For all real numbers p, q and r, $p - q - r = p - r - q$.

24. For all real numbers x, y and z, $(x + y) + z = z + (x + y)$.

25. For all real numbers m and n, $\frac{m}{m} \cdot n = \frac{n}{n} \cdot m$.

26. Writing Explain why the commutative and associative properties don't hold true for subtraction and division but the identity properties do.

27. Reasoning A recipe for brownies calls for mixing one cup of sugar with two cups of flour and 4 ounces of chocolate. They are all to be mixed in a bowl before baking. Will the brownies taste different if you add the ingredients in different orders? Relate your answer to a property of real numbers.

Simplify each expression. Justify each step.

28. $(6^7)(5^3 + 2)(2 - 2)$

29. $(m - 16)(-7 \div -7)$

30. Open-Ended Provide examples to show the following.

a. The associative property of addition holds true for negative integers.

b. The commutative property of multiplication holds true for non-integers.

c. The multiplicative property of negative one holds true regardless of the sign of the number on which the operation is performed.

d. The commutative property of multiplication holds true if one of the factors is zero.