

**Chapter 3 (3.1-3.3) Algebraic Expressions and Properties Study Guide****Write an algebraic expression for each situation:**

1. Jessica rode 9 miles farther than Roger rode. Let  $r$  represent the number of miles Roger rode. Write an algebraic expression for the number of miles Jessica rode.

\_\_\_\_\_

2. Let  $m$  represent the number of children playing soccer. Those children are separated into 4 equal teams. Write an expression for the number of children on each team.

\_\_\_\_\_

3. Glenda bought some apps for her tablet. Each app cost \$5. Let  $n$  represent the number of apps she bought. Write an expression to show the total amount she spent.

\_\_\_\_\_

**Write each phrase as an algebraic expression.**

4. 25 decreased by a number  $a$

\_\_\_\_\_

5. 3 greater  $n$

\_\_\_\_\_

6.  $r$  divided by 8

\_\_\_\_\_

7. The product of 7 and  $m$

\_\_\_\_\_

8. 15 less than a number  $g$

\_\_\_\_\_

9. 18 divided by the sum of 3 and a number  $k$

\_\_\_\_\_

10. 189 minus the product of  $t$  and 8

\_\_\_\_\_

11. The sum of  $w$  and 253

\_\_\_\_\_

**Write the expression as a word phrase.**

12.  $5t + 23$

\_\_\_\_\_

13.  $45 - n$

\_\_\_\_\_

14.  $15 + (y \div 6)$

\_\_\_\_\_

Name: \_\_\_\_\_ Hour: \_\_\_\_\_

Evaluate each expression for the given value(s) of the variable(s). Be sure to follow order of operations. Show SUBSTITUTION and all work!!!

15.  $5a - 4$  when  $a = 16$

16.  $\frac{b}{11}$  when  $b = 33$

17.  $g^2 + 23$  when  $g = 6$

18.  $5(9 + d) - 6$  when  $d = 3$

19.  $hj - 3$  when  $h = 8$  and  $j = 11$

20.  $r(s^2)(t)$  when  $r = 2$ ,  $s = 3$ , and  $t = 5$

**Solve.**

21. The volume of a pyramid with a square base is given by the expression  $\frac{1}{3}s^2h$ , where  $s$  is the length of a side of the base and  $h$  is the height. Find the volume of a pyramid where the side length is 6 and a height of 20 feet.

22. To change knots per hour to miles per hour, use the expression  $1.15k$ , where  $k$  is the speed in knots per hour. A plane is flying at 300 knots per hour. How fast is that plane flying in miles per hour?

23. Tell which property is represented. Be specific (addition or multiplication)!!

a.  $4(7 + 5) = (4 \cdot 7) + (4 \cdot 5)$  \_\_\_\_\_

b.  $2 \cdot (4 \cdot 7) = (2 \cdot 4) \cdot 7$  \_\_\_\_\_

c.  $6 \cdot 8 = 8 \cdot 6$  \_\_\_\_\_

d.  $23 + 0 = 23$  \_\_\_\_\_

e.  $1 \cdot 14 = 14$  \_\_\_\_\_

f.  $5 + (6+3) = (5+6) + 3$  \_\_\_\_\_

The following expressions have been simplified to create equivalent expressions.

Tell which property justifies each step.

24.  $10(6 + 12)$   
 $(10 \cdot 6) + (10 \cdot 12)$  \_\_\_\_\_  
 $60 + 120$   
 $180$

25.  $(5.4 + x) + 3.1$   
 $(x + 5.4) + 3.1$  \_\_\_\_\_  
 $x + (5.4 + 3.1)$  \_\_\_\_\_  
 $x + 8.5$

26.  $7 \cdot (1 \cdot p)$   
 $7 \cdot p$  \_\_\_\_\_

27.  $(c + 47) + 0$   
 $c + (47 + 0)$  \_\_\_\_\_  
 $c + 47$  \_\_\_\_\_

28.  $8(92)$   
 $8(90 + 2)$   
 $8(90) + 8(2)$  \_\_\_\_\_  
 $720 + 16$   
 $736$

**Simplify the expression. Tell which property justifies each step.**

29.  $12 + x + 11$

\_\_\_\_\_

\_\_\_\_\_

30.  $4(3y)$

\_\_\_\_\_

\_\_\_\_\_

31.  $9 + (17 + x)$

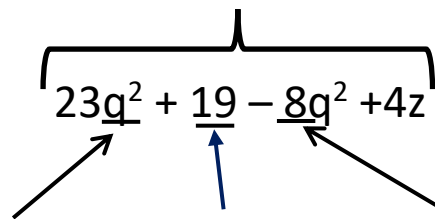
\_\_\_\_\_

\_\_\_\_\_

**32. Use the word bank to label the 4 parts of the picture and fill in the blanks in the questions. There will be 10 words left over in the word bank when you are done.**

Terms	Algebraic Expression	Evaluate	Parenthesis
Coefficient	Equivalent Expression	Like Terms	Properties of Numbers
	Constant	Commutative	
Exponent	Substitute	Variable	Numeric Expression

a) \_\_\_\_\_



b) \_\_\_\_\_ c) \_\_\_\_\_ d) \_\_\_\_\_

**33. Identify the terms, coefficients, and constants in each expression:**

$4x + 56$

Terms:

Coefficients:

Constants:

$5y^2 + x + \frac{3}{4}$

Terms:

Coefficients:

Constants:

$c^2 + 7c$

Terms:

Coefficients:

Constants: