

**Practice  
3-1*****Expressions to Equations***

1. Identify  $g - h = 8$  as an expression or an equation.
2. Is  $81 - 9 = 72$  true, false, or an open sentence?
3. Which expression is equivalent to  $11c - 4c$ ?  
☐ A.  $5c + 2c$  ☐ B.  $3c + 7c$
4. Use the distributive property to rewrite the expression  $3(x + 8)$  without parentheses.
5. Circle the number that is a solution of  $19 - q = 12$ .  
8, 7, 4, 6, or 2
6. Which equations have 6 as a solution? Check all that apply.  
☐ A.  $8b = 48$  ☐ C.  $b + 3 = 9$   
☐ B.  $11 - b = 6$  ☐ D.  $54 \div b = 9$
7. **Open-Ended** Think about the last time you went to your favorite store.
  - a) Describe the items you bought, the cost of each, and how much you spent in all.
  - b) Write an *expression* to represent your purchases.
  - c) Write an *equation* using this expression and how much you spent in all.
  - d) What is the difference between the expression and the equation you wrote?  
☐ A. The equation includes and equals sign. The expression does not.  
☐ B. The equation uses different variables than the expression.  
☐ C. The expression uses more operations than the equation.  
☐ D. The expression has more terms than the equation.
8. **Reasoning** Name the properties of operations used in each step to show that the expressions  $6 + 5(x + 9)$  and  $5x + 51$  are equivalent.

$$\begin{aligned} 6 + 5(x + 9) &= 6 + (5x + 45) && \underline{\hspace{2cm}} \\ &= 6 + (45 + 5x) && \underline{\hspace{2cm}} \\ &= (6 + 45) + 5x && \underline{\hspace{2cm}} \\ &= 51 + 5x && \underline{\text{Definition of Addition}} \\ &= 5x + 51 && \underline{\hspace{2cm}} \end{aligned}$$

**9. Error Analysis** A student was asked to use the Distributive Property to find an expression equivalent to  $8(w - 4)$ . The student got the expression  $4w$ . These expressions are not equivalent.

- a) What is the correct equivalent expression?
- b) Which sentence best describes what the student did wrong?
- ☐ A. The student did not apply the Distributive Property correctly.
  - ☐ B. The student applied the Associative Property instead of the Distributive Property.
  - ☐ C. The student added to simplify the expression. The student should have subtracted.
  - ☐ D. The student subtracted to simplify the expression. The student should have added.

**10. Writing** Your teacher solved the equation  $4x + 1 = 22 + x$ . Unfortunately, due to messy handwriting, you are not sure if the solution is 2, 7, or 8.

- a) Describe how you can find the solution without solving the equation again.
- b) Use this to find the solution.

**11. Entertainment** A group of 4 friends is planning a fun day trip. To raft down a river costs \$6 per person plus \$5 for transportation of the raft. An amusement park costs \$14 per person. A hot air balloon ride costs \$30 per person, but they have a \$40 group discount coupon.

Activity	Cost (\$)
Raft Trip	$6n + 5 = 29$
Amusement Park	$14n = 29$
Balloon Ride	$30n - 40 = 29$

The table shows equations for the total cost of each activity for  $n$  people. Which activity should they choose if they want to spend exactly \$29?

**12.** Is  $5x + 2(x - 4) = 6$  an expression or an equation?

**13.** Which number is a solution to  $x + 29 = 1 + 5x$ ?

- ☐ A. 8
- ☐ B. 9
- ☐ C. 3
- ☐ D. 7
- ☐ E. 6

**14. Think About the Process** There are many expressions equivalent to  $8(d + 7) - 6d$ . Complete the following steps using the properties shown to find a particular equivalent expression. What is this equivalent expression?

$$\begin{aligned}
 8(d + 7) - 6d &= \underline{\hspace{2cm}} \text{ Distributive Property} \\
 &= \underline{\hspace{2cm}} \text{ Commutative Property of Addition} \\
 &= \underline{\hspace{2cm}} \text{ Distributive Property} \\
 &= \underline{\hspace{2cm}} \text{ Definition of Subtraction}
 \end{aligned}$$

**15. Think About the Process** Write three different equations that have 1 as a solution. Use  $x$  as the variable. Use substitution to show that your equations are true when  $x$  is 1. What is the simplest possible equation that has 1 as a solution?