

## THINK AND DISCUSS

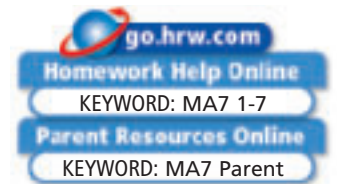
- Tell which property is described by this sentence: When adding three numbers, you can add the first number to the sum of the second and third numbers, or you can add the third number to the sum of the first and second numbers.
- GET ORGANIZED** Copy and complete the graphic organizer below. In each box, give an example to illustrate the given property.



Associati e	Commutati e	Distributi e
<input type="text"/>	<input type="text"/>	<input type="text"/>

## 1-7

## Exercises



### GUIDED PRACTICE

- Vocabulary** The \_\_\_\_\_? Property states the following:  
 $(a + b) + c = a + (b + c)$ . (*Associative, Commutative, or Distributive*)

**SEE EXAMPLE 1** Simplify each expression.

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- |                                   |   |                            |
|-----------------------------------|---|----------------------------|
| 2. $-12 + 67 + 12 + 23$           | 3. $16 + 2\frac{1}{2} + 4 + 1\frac{1}{2}$ | 4. $27 + 98 + 73$          |
| 5. $\frac{1}{3} \cdot 8 \cdot 21$ | 6. $2 \cdot 38 \cdot 50$                  | 7. $50 \cdot 118 \cdot 20$ |

**SEE EXAMPLE 2** Write each product using the Distributive Property. Then simplify.

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- |               |               |              |
|---------------|---------------|--------------|
| 8. $14(1002)$ | 9. $16(19)$   | 10. $9(38)$  |
| 11. $8(57)$   | 12. $12(112)$ | 13. $7(109)$ |

**SEE EXAMPLE 3** Simplify each expression by combining like terms.

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- |                |                 |                   |
|----------------|-----------------|-------------------|
| 14. $6x + 10x$ | 15. $35x - 15x$ | 16. $-3a + 9a$    |
| 17. $-8r - r$  | 18. $17x^2 + x$ | 19. $3.2x + 4.7x$ |

**SEE EXAMPLE 4** Simplify each expression. Justify each step with an operation or property.

p. 48

- |                          |                         |                          |
|--------------------------|-------------------------|--------------------------|
| 20. $5(x + 3) - 7x$      | 21. $9(a - 3) - 4$      | 22. $5x^2 - 2(x - 3x^2)$ |
| 23. $6x - x - 3x^2 + 2x$ | 24. $12x + 8x + t - 7x$ | 25. $4a - 2(a - 1)$      |

### PRACTICE AND PROBLEM SOLVING

Simplify each expression.

- |                         |                           |                         |                             |
|-------------------------|---------------------------|-------------------------|-----------------------------|
| 26. $53 + 28 + 17 + 12$ | 27. $5 \cdot 14 \cdot 20$ | 28. $6 \cdot 3 \cdot 5$ | 29. $4.5 + 7.1 + 8.5 + 3.9$ |
|-------------------------|---------------------------|-------------------------|-----------------------------|

Write each product using the Distributive Property. Then simplify.

- |             |             |              |             |
|-------------|-------------|--------------|-------------|
| 30. $9(62)$ | 31. $8(29)$ | 32. $11(25)$ | 33. $6(53)$ |
|-------------|-------------|--------------|-------------|

**Independent Practice**

For Exercises	See Example
26–29	1
30–33	2
34–37	3
38–43	4

**Extra Practice**

Skills Practice p. S5

Application Practice p. S28

Simplify each expression by combining like terms.

34.  $3x + 9x$       35.  $14x^2 - 5x^2$       36.  $-7x + 8x$       37.  $3x^2 - 4$

Simplify each expression. Justify each step with an operation or property.

38.  $4(y + 6) + 9$       39.  $-7(x + 2) + 4x$       40.  $3x + 2 - 2x - 1$   
 41.  $5x - 3x + 3x^2 + 9x$       42.  $8x + 2x - 3y - 9x$       43.  $7y - 3 + 6y - 7$

44. **Estimation** Tavon bought a binder, 3 spiral notebooks, and a pen. The binder cost \$4.89, the notebooks cost \$1.99 each, and the pen cost \$2.11. About how much did Tavon spend on school supplies?
45. **Sports** In a triathlon, athletes race in swimming, biking, and running events. The athlete with the shortest total time to complete the events is the winner.

Times from Triathlon			
Athlete	Swim (min:s)	Bike (min:s)	Run (min:s)
Amy	18:51	45:17	34:13
Julie	17:13	40:27	23:32
Mardi	19:09	38:58	25:32
Sabine	13:09	31:37	19:01

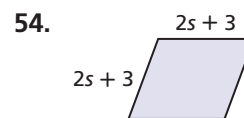
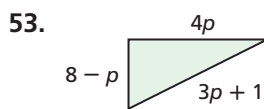
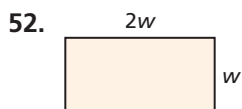
- a. Find the total time for each athlete. (*Hint*: 1 minute = 60 seconds)  
 b. Use the total times for the athletes to determine the order in which they finished the triathlon.

Name the property that is illustrated in each equation.

46.  $5 + x = x + 5$       47.  $x - 2 = -2 + x$       48.  $2 + (3 + y) = (2 + 3) + y$   
 49.  $3(2r - 7) = 3(2r) - 3(7)$       50.  $(2 + g) + 3 = 2 + (g + 3)$       51.  $45x - 35 = 5(9x) - 5(7)$



**Geometry** Give an expression in simplified form for the perimeter of each figure.



55. **Critical Thinking** Evaluate  $a - (b - c)$  and  $(a - b) - c$  for  $a = 10$ ,  $b = 7$ , and  $c = 3$ . Based on your answers, explain whether there is an Associative Property of Subtraction.



56. **Write About It** Describe a real-world situation that can be represented by the Distributive Property. Translate your situation into an algebraic expression. Define each variable you use.

**MULTI-STEP TEST PREP**



57. This problem will prepare you for the Multi-Step Test Prep on page 60.

- a. The diagram shows a pattern of shapes that can be folded to make a cylinder. How is the length  $\ell$  of the rectangle related to the circumference of (distance around) each circle?  
 b. An expression for the circumference of each circle is  $2\pi r$ . Write an expression for the area of the rectangle.  
 c. Use these expressions to write an expression for the total area of the figures. Leave the symbol  $\pi$  in your expression.

