| Name: |
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|-------|

#### Class: \_

### \_\_\_\_\_ Date: \_\_\_\_

## **Operations properties**

### **Multiple Choice**

Identify the choice that best completes the statement or answers the question.

1. The table shows, step-by-step, how to simplify the algebraic expression 3(x-5) + 4x. Justify Step 4.

| Step | Procedure      | Justification         |
|------|----------------|-----------------------|
| 1.   | 3(x-5) + 4x    |                       |
| 2.   | 3x - 3(5) + 4x | Distributive Property |
| 3.   | 3x - 15 + 4x   |                       |
| 4.   | 3x + 4x - 15   |                       |
| 5.   | (3x+4x) - 15   |                       |
| 6.   | 7x - 15        |                       |

a. Multiply

c. Combine like terms

b. Associative Property

- d. Commutative Property
- 2. Fill in the missing justifications.

| Procedure                             | Justification             |
|---------------------------------------|---------------------------|
| 13x - 9 - 6x = 13x + (-9) + (-6x)     | Definition of subtraction |
| = 13x + (-6)x + (-9)                  | 2                         |
| $= \left[ 13x + (-6)x \right] + (-9)$ | ?                         |
| = [13 + (-6)]x + (-9)                 | ?                         |
| =7x + (-9)                            | Simplify                  |
| =7x-9                                 | Definition of subtraction |

- a. Distributive Property; Associative Property; Commutative Property
- b. Associative Property; Commutative Property; Distributive Property
- c. Commutative Property; Distributive Property; Associative Property
- d. Commutative Property; Associative Property; Distributive Property

### What property is illustrated by each statement?

- 3.  $-2.1 \times 1 = -2.1$ 
  - a. Inverse Property of Multiplication
  - b. Multiplication Property of -1
  - c. Identity Property of Addition
  - d. Identity Property of Multiplication
- 4. 0 + x = x
  - a. Identity Property of Addition
  - b. Multiplication Property of 0
  - c. Commutative Property of Addition
  - d. Inverse Property of Multiplication

- 5. 8 + 3.4 = 3.4 + 8
  - a. Inverse Property of Addition
  - b. Associative Property of Addition
  - c. Commutative Property of Addition
  - d. Inverse Property of Multiplication
- - a. Inverse Property of Addition
  - b. Associative Property of Addition
  - c. Commutative Property of Multiplication
  - d. Commutative Property of Addition

$$---- 7. \ 2\left(-\frac{10}{2}\right) = \left(-\frac{10}{2}\right)2$$

- a. Commutative Property of Addition
- b. Inverse Property of Multiplication
- c. Associative Property of Addition
- d. Commutative Property of Multiplication
- 8. 4 + 2.2 = 2.2 + 4
  - a. Commutative Property of Addition
  - b. Inverse Property of Addition
  - c. Associative Property of Addition
  - d. Inverse Property of Multiplication

### Matching

Match each vocabulary term with its definition.

- a. real numbers
- b. positive numbers
- c. negative numbers
- d. integers
- e. irrational numbers
- f. rational numbers
- g. natural numbers
- h. whole numbers
- 9. the set of numbers that can be written in the form  $\frac{a}{b}$ , where a and b are integers and  $b \neq 0$
- \_\_\_\_\_ 10. the set of counting numbers
- \_\_\_\_\_ 11. the set of natural numbers and zero
- \_\_\_\_\_ 12. the set of rational and irrational numbers
- \_\_\_\_\_ 13. the set of whole numbers and their opposites
- \_\_\_\_\_ 14. the set of real numbers that cannot be written as a ratio of integers

# **Operations properties Answer Section**

### **MULTIPLE CHOICE**

### 1. D

The Commutative Property allows for you to add or subtract terms in any order.

|   | Feedback                                    |
|---|---|
| Α | Multiplication is used in Step 3.           |
| в | The Associative Property is used in Step 5. |
| С | Like terms are combined in Step 6.          |
| D | Correct!                                    |

2. D

| Procedure                             | Justification             |
|---------------------------------------|---------------------------|
| 13x - 9 - 6x = 13x + (-9) + (-6x)     | Definition of subtraction |
| = 13x + (-6)x + (-9)                  | Commutative Property      |
| $= \left[ 13x + (-6)x \right] + (-9)$ | Associative Property      |
| = [13 + (-6)]x + (-9)                 | Distributive Property     |
| =7x+(-9)                              | Simplify 2                |
| =7x-9                                 | Definition of subtraction |
| dine                                  |                           |

|   | Feedback   |
|---|--|
| Α | What is the difference between the Commutative Property and the Distributive           |
|   | Property?  |
| В | The Associative Property involves grouping of numbers. What does the Commutative       |
|   | Property state?  |
| С | What is the difference between the Associative Property and the Distributive Property? |
| D | Correct!   |
| р |  |

### 3. D

- 4. A
- 5. C
- 6. B
- 7. D
- 8. A

#### MATCHING

9. F

10. G

- 11. H
- 12. A
- 13. D
- 14. E