

## Lesson 16: Applying the Properties of Operations to Multiply and Divide Rational Numbers

### Classwork

#### Example 1: Using the Commutative and Associative Properties to Efficiently Multiply Rational Numbers

- a. Evaluate the expression below.

$$-6 \times 2 \times (-2) \times (-5) \times (-3)$$

- b. What types of strategies were used to evaluate the expressions?
- c. Can you identify the benefits of choosing one strategy versus another?
- d. What is the sign of the product, and how was the sign determined?

**Exercise 1**

Find an efficient strategy to evaluate the expression and complete the necessary work.

$$-1 \times (-3) \times 10 \times (-2) \times 2$$

**Exercise 2**

Find an efficient strategy to evaluate the expression and complete the necessary work.

$$4 \times \frac{1}{3} \times (-8) \times 9 \times \left(-\frac{1}{2}\right)$$

**Exercise 3**

What terms did you combine first and why?

**Exercise 4**

Refer to the example and exercises. Do you see an easy way to determine the sign of the product first?

**Example 2: Using the Distributive Property to Multiply Rational Numbers**

Rewrite the mixed number as a sum; then, multiply using the distributive property.

$$-6 \times \left(5\frac{1}{3}\right)$$

**Exercise 5**

Multiply the expression using the distributive property.

$$9 \times \left(-3\frac{1}{2}\right)$$

**Example 3: Using the Distributive Property to Multiply Rational Numbers**

Evaluate using the distributive property.

$$16 \times \left(-\frac{3}{8}\right) + 16 \times \frac{1}{4}$$

**Example 4: Using the Multiplicative Inverse to Rewrite Division as Multiplication**

Rewrite the expression as only multiplication and evaluate.

$$1 \div \frac{2}{3} \times (-8) \times 3 \div \left(-\frac{1}{2}\right)$$

**Exercise 6**

$$4.2 \times \left(-\frac{1}{3}\right) \div \frac{1}{6} \times (-10)$$