Learning Objective: Students will be able to use properties to show that expressions are equivalent.

Warm Up

1. $2\frac{1}{6} \times \frac{3}{5} \times \frac{5}{6}$

5. $\frac{1}{2} \times 3\frac{3}{4} \times \frac{17}{5}$

2. $\frac{1}{3} \times \frac{4}{7} \times 3\frac{3}{4}$

6. $\frac{1}{3} \times 1\frac{2}{3} \times \frac{12}{7}$

3. $1\frac{1}{6} \times \frac{2}{3} \times 2\frac{1}{5}$

7. $\frac{2}{3} \times 3\frac{3}{7} \times 1\frac{1}{2}$

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Warm Up Answers

1. $2\frac{1}{6} \times \frac{3}{5} \times \frac{5}{6}$

   $= \frac{13}{12} = 1\frac{1}{12}$

2. $\frac{1}{3} \times \frac{4}{7} \times 3\frac{3}{4}$

   $= \frac{5}{7}$

3. $1\frac{1}{6} \times \frac{2}{3} \times 2\frac{1}{5}$

   $= \frac{77}{45} = 1\frac{32}{45}$

5. $\frac{1}{2} \times 3\frac{3}{4} \times \frac{17}{5}$

   $= \frac{51}{8} = 6\frac{3}{8}$

6. $\frac{1}{3} \times 1\frac{2}{3} \times \frac{12}{7}$

   $= \frac{20}{21}$

7. $\frac{2}{3} \times 3\frac{3}{7} \times 1\frac{1}{2}$

   $= \frac{24}{7} = 3\frac{3}{7}$

Lesson 3.3   December 5, 2015

Essential Question:

Does the order in which you perform an operation matter?

Lesson 3.3

December 5, 2015

Lesson Objective:

Students will be able to:

use properties to show that expressions are equivalent.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to use properties to show that expressions are equivalent.
3	I can use properties to show that expressions are equivalent.
2	I recognize, but still need help to use properties to show that expressions are equivalent.
1	I do not know how to use properties to show that expressions are equivalent.

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1 ACTIVITY: Does Order Matter?

Work with a partner. Place each statement in the correct oval.

a. Fasten 5 shirt buttons.
c. Fill and seal an envelope.
e. Put on your shoes.

b. Put on a shirt and tie.
d. Floss your teeth.
f. Chew and swallow.

Order Matters

Order Doesn't Matter

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Equivalent Expressions

Expressions with the same value

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Commutative Properties

Words   Changing the order of addends or factors does not change the sum or product.

Numbers $5 + 8 = 8 + 5$ **Algebra** $a + b = b + a$

$5 \cdot 8 = 8 \cdot 5$ $a \cdot b = b \cdot a$

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Associative Properties

Words Changing the grouping of addends or factors does not change the sum or product.

Numbers $(7 + 4) + 2 = 7 + (4 + 2)$

$(7 \cdot 4) \cdot 2 = 7 \cdot (4 \cdot 2)$

Algebra $(a + b) + c = a + (b + c)$

$(a \cdot b) \cdot c = a \cdot (b \cdot c)$

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1 **Using Properties to Write Equivalent Expressions**

a. **Simplify the expression** $7 + (12 + x)$**.**

$$7 + (12 + x) = (7 + 12) + x \qquad \text{Associative Property of Addition}$$
$$= 19 + x \qquad \text{Add 7 and 12.}$$

b. **Simplify the expression** $(6.1 + x) + 8.4$**.**

$$(6.1 + x) + 8.4 = (x + 6.1) + 8.4 \qquad \text{Commutative Property of Addition}$$
$$= x + (6.1 + 8.4) \qquad \text{Associative Property of Addition}$$
$$= x + 14.5 \qquad \text{Add 6.1 and 8.4.}$$

c. **Simplify the expression** $5(11y)$**.**

$$5(11y) = (5 \cdot 11)y \qquad \text{Associative Property of Multiplication}$$
$$= 55y \qquad \text{Multiply 5 and 11.}$$

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Key Ideas

Addition Property of Zero

Words   The sum of any number and 0 is that number.

Numbers $7 + 0 = 7$ **Algebra** $a + 0 = a$

Multiplication Properties of Zero and One

Words   The product of any number and 0 is 0.

The product of any number and 1 is that number.

Numbers $9 \cdot 0 = 0$ **Algebra** $a \cdot 0 = 0$

$4 \cdot 1 = 4$ $a \cdot 1 = a$

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2 Using Properties to Write Equivalent Expressions

a. Simplify the expression $9 \cdot 0 \cdot p$.

$$9 \cdot 0 \cdot p = (9 \cdot 0) \cdot p \qquad \text{Associative Property of Multiplication}$$

$$= 0 \cdot p = 0 \qquad \text{Multiplication Property of Zero}$$

b. Simplify the expression $4.5 \cdot r \cdot 1$.

$$4.5 \cdot r \cdot 1 = 4.5 \cdot (r \cdot 1) \qquad \text{Associative Property of Multiplication}$$

$$= 4.5 \cdot r \qquad \text{Multiplication Property of One}$$

$$= 4.5r$$

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Assignment

Complete problems 6, 8, 10, 14, 20, 22, 26, 28, & 34 on pages 130 - 131 in your Big Ideas Text Book.

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Lesson 3.3

Essential Question:

Does the order in which you perform an operation matter?

Lesson 3.3   December 5, 2015

Lesson Objective:

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Self-Evaluation Scale

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Homework

In your Big Ideas Record and Practice Journal page 68.