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

Warm Up

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

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

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

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

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

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. $\frac{2}{3} \times 3\frac{3}{7} \times 1\frac{1}{2}$
$= \frac{24}{7} = 3\frac{3}{7}$

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Lesson 3.3 November 16, 2016

Essential Question:

Does the order in which you perform an operation matter?

Lesson Objective:

Students will be able to:

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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.
b. Put on a shirt and tie.
c. Fill and seal an envelope.
d. Floss your teeth.
e. Put on your shoes.
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 $5 + 8 = 8 + 5$ $5 \cdot 8 = 8 \cdot 5$

Algebra $a + b = b + a$ $a \cdot b = b \cdot a$

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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 $7 + (12 + x)$.

$7 + (12 + x) = (7 + 12) + x$ Associative Property of Addition

$= 19 + x$ Add 7 and 12.

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

$(6.1 + x) + 8.4 = (x + 6.1) + 8.4$ Commutative Property of Addition

$= x + (6.1 + 8.4)$ Associative Property of Addition

$= x + 14.5$ Add 6.1 and 8.4.

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

$5(11y) = (5 \cdot 11)y$ Associative Property of Multiplication

$= 55y$ 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 $9 \cdot 0 \cdot p$.

$9 \cdot 0 \cdot p = (9 \cdot 0) \cdot p$ Associative Property of Multiplication

$= 0 \cdot p = 0$ Multiplication Property of Zero

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

$4.5 \cdot r \cdot 1 = 4.5 \cdot (r \cdot 1)$ Associative Property of Multiplication

$= 4.5 \cdot r$ 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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Essential Question:

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Homework