

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

$$1. 2\frac{1}{6} \times \frac{3}{5} \times \frac{5}{6} \\ = \frac{13}{12} = 1\frac{1}{12}$$

$$5. \frac{1}{2} \times 3\frac{3}{4} \times \frac{17}{5} \\ = \frac{51}{8} = 6\frac{3}{8}$$

$$2. \frac{1}{3} \times \frac{4}{7} \times 3\frac{3}{4} \\ = \frac{5}{7}$$

$$6. \frac{1}{3} \times 1\frac{2}{3} \times \frac{12}{7} \\ = \frac{20}{21}$$

$$3. 1\frac{1}{6} \times \frac{2}{3} \times 2\frac{1}{5} \\ = \frac{77}{45} = 1\frac{32}{45}$$

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

Lesson 3.3

December 1, 2014

Essential Question:

Does the order in which you perform an operation matter?

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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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December 1, 2014 Lesson 3.3 Period 3

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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 $7 + (12 + x)$.

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

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

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

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

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

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