

8.2 Properties of Multiplication

Inverse Property of Multiplication

- the ^{multiplication} product of two reciprocals, or multiplicative inverse, is 1

$$\begin{array}{c} \text{Ex)} \\ \frac{7}{16} \cdot \frac{16}{7} \\ \hline = 1 \end{array}$$

Reciprocals - $\frac{1}{2}$ to $\frac{2}{1}$

or $1\frac{3}{4}$ to $\frac{4}{7}$
 $\frac{7}{4}$

How to use the Properties

Commutative Property - to reorder

Associative Property - to regroup

Distributive Property - to rewrite the product of a number as a sum or difference

Two other Properties:

1. Zero Property of Multiplication $\frac{1}{2} \times 0 = 0$
2. Identity Property $\frac{1}{3} \times 1 = \frac{1}{3}$

$$\frac{2}{3} \times \frac{3}{5} = \frac{3}{5} \times \frac{2}{3}$$

$$(\frac{1}{2} \times \frac{1}{5}) \times 5 = \frac{1}{2} \times (\frac{1}{5} \times 5)$$

$$\frac{1}{3}(\frac{3}{7} + \frac{2}{7}) = \frac{1}{3} \times \frac{3}{7} + \frac{1}{3} \times \frac{2}{7}$$

Practice Identifying Properties

a.) $p \times \frac{1}{3} = \frac{1}{3} \times p$ Commutative

b.) $1 \times \frac{1}{2} = \frac{1}{2}$ identity

c.) $0 \times \frac{1}{2} = 0$ Zero property of multiplication

d.) $(4 \times \frac{1}{2}) \times \frac{7}{8} = 4 (\frac{1}{2} \times \frac{7}{8})$ associative

e.) $n(\frac{3}{5} + \frac{1}{5}) = (n \times \frac{3}{5}) + (n \times \frac{1}{5})$

distributive

Find the Missing Pieces

1. $\frac{1}{3} \times \frac{2}{3} = \frac{2}{3} \times ?$ Commutative

$\frac{1}{3}$

2. $\frac{3}{4} \times ? = \frac{3}{4}$ identity

1

Can you identify the properties as we go?

Find the Missing Pieces

3. $(?) \times \frac{1}{2} = 0$

0

Zero property of multiplication

4. $\frac{2}{7} (\frac{3}{5} \times \frac{1}{6}) = (\frac{2}{7} \times ?) \frac{1}{6}$

associative

$\frac{3}{5}$

Can you identify the properties as we go?