

5.3 Multiplication and Division Equations

Multiplication and division are inverse operations, which means they UNDO each other.

Division undoes multiplication. Use the Division Property of Equality to keep the two sides of the equation balanced.

Multiplication undoes division. Use the Multiplication Property of Equality to keep the two sides of the equation balanced.

Example: Solve. Identify whether you used the Multiplication or Division Property of Equality.

$$1.) \quad 38x = 760$$

$$\begin{array}{r} 20 \\ 38 \overline{) 760} \\ \underline{-760} \\ 00 \\ \underline{-0} \\ 0 \end{array}$$

$$x = 760 \div 38$$

$$x = 20$$

Division Prop. of Equality

$$3.) \quad 8b = 0.2416$$

$$\begin{array}{r} 0.0302 \\ 8 \overline{) 0.2416} \\ \underline{-0.2416} \\ 016 \\ \underline{-16} \\ 0 \end{array}$$

$$b = 0.2416 \div 8$$

$$b = 0.0302$$

Division Prop. of Equality

$$2.) \quad z \div 13 = 650$$

$$\begin{array}{r} 8450 \\ 13 \overline{) 10950} \\ \underline{-7950} \\ 3000 \\ \underline{-2600} \\ 4000 \\ \underline{-3900} \\ 1000 \\ \underline{-9100} \\ 900 \end{array}$$

$$z = 650 \cdot 13$$

$$z = 8450$$

Multiplication Prop. of Equality

$$4.) \quad \frac{d}{16} = 8$$

$$d = 8 \cdot 16$$

$$\begin{array}{r} 128 \\ 16 \overline{) 128} \\ \underline{-128} \\ 0 \end{array}$$

$$d = 128$$

Multiplication Prop. of Equality

Example: Solve each equation.

5.) $44664 \div 16 = 16q$
 $44664 \div 16 = q$
 $2791.5 = q$

$$\begin{array}{r} 2791.5 \\ 16 \overline{) 44664.0} \\ \underline{-32} \\ 126 \\ \underline{-112} \\ 146 \\ \underline{-144} \\ 184 \\ \underline{-16} \\ 80 \\ \underline{-80} \\ 0 \end{array}$$

6.) $1.13 \div 0.09 = p$
 $1.13 \cdot 0.09 = p$
 $0.1017 = p$

$$\begin{array}{r} 113 \\ \times 9 \\ \hline 1017 \end{array}$$

7.) $\frac{z}{15} = 1.198$
 $z = 1.198 \cdot 15$
 $z = 17.970$
 or
 $z = 17.97$

$$\begin{array}{r} 1198 \\ \times 15 \\ \hline 5990 \\ + 11980 \\ \hline 17970 \end{array}$$

8.) $0.33b = 5.61$
 $b = 5.61 \div 0.33$
 $b = 17$

$$\begin{array}{r} 17. \\ 0.33 \overline{) 5.61} \\ \underline{-3.3} \\ 231 \\ \underline{-231} \\ 0 \end{array}$$

9.) The division quotient of a number y and 49 is three hundred two.
 $y \div 49 = 302$
 $y = 302 \cdot 49$
 $y = 14798$

$$\begin{array}{r} 302 \\ \times 49 \\ \hline 2718 \\ + 12080 \\ \hline 14798 \end{array}$$

10.) Tyler is building a wooden birdhouse. He cuts a 165 cm long piece of wood into 15 equal pieces. Each piece is x cm long. Write a multiplication equation to represent the situation and solve to find the length of each piece of wood.

Each piece is 11cm long.

$15 \cdot x = 165$
 $\div 15 \quad \div 15$
 $x = 165 \div 15$
 $x = 11$

$$\begin{array}{r} 11 \\ 15 \overline{) 165} \\ \underline{-15} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$