

2.1 One Step Equations

Inverse Operations: opposite operations that can undo each other.

Addition and Subtraction

Multiplication and Division

You must perform the same operation of each side of the equation which produces equivalent expressions.

Addition Property of Equality:

Ex. 1: Solve $x - 12 = 3$

$$\begin{array}{r} x - 12 = 3 \\ +12 \quad +12 \\ \hline x = 15 \end{array}$$

Subtraction Property of Equality:

Ex. 2: Solve $x + 7 = 4$

$$\begin{array}{r} x + 7 = 4 \\ -7 \quad -7 \\ \hline x = -3 \end{array}$$

Multiplication Property of Equality:

Ex. 3: Solve $\frac{x}{3} = 5 \cdot 3$

$$\begin{array}{r} \frac{x}{3} = 5 \cdot 3 \\ \cdot 3 \quad \cdot 3 \\ \hline x = 15 \end{array}$$

Division Property of Equality:

Ex. 4: Solve $-6x = 48$

$$\begin{array}{r} -6x = 48 \\ \div -6 \quad \div -6 \\ \hline x = -8 \end{array}$$

Ex. 5: Solve the following equations.

a.) $y + 7 = 10$

$$\begin{array}{r} y + 7 = 10 \\ -7 \quad -7 \\ \hline y = 3 \end{array}$$

c.) $x - 5 = 3$

$$\begin{array}{r} x - 5 = 3 \\ +5 \quad +5 \\ \hline x = 8 \end{array}$$

e.) $6 = t - 2$

$$\begin{array}{r} 6 = t - 2 \\ +2 \quad +2 \\ \hline t = 8 \end{array}$$

b.) $6w = -54$

$$\begin{array}{r} 6w = -54 \\ \div 6 \quad \div 6 \\ \hline w = -9 \end{array}$$

d.) $\frac{t}{3} = 9 \cdot -3$

$$\begin{array}{r} \frac{t}{3} = 9 \cdot -3 \\ \cdot 3 \quad \cdot 3 \\ \hline t = -27 \end{array}$$

f.) $13 = \frac{z}{-2} \cdot -2$

$$\begin{array}{r} 13 = \frac{z}{-2} \cdot -2 \\ \cdot -2 \quad \cdot -2 \\ \hline z = -26 \end{array}$$

Using Reciprocals. Remember the product of a number and its reciprocal is 1.

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

$$\frac{-1}{4} = \frac{-4}{1}$$

$$\frac{25}{-3} = \frac{-3}{25}$$

Solve the equations by multiplying by a reciprocal. * Do NOT Divide!

Ex. 6: $-\frac{1}{2} \cdot \frac{2}{7} x = 4$ $\frac{2}{1} \cdot \frac{7}{2}$

$$x = -14$$

Ex. 7: $\frac{4}{5} \cdot \frac{5}{6} w = 10$ $\frac{2}{1} \cdot \frac{6}{8}$

$$w = 12$$

Ex. 8: $\frac{3}{2} \cdot \frac{2}{3} p = 14$ $\frac{7}{1} \cdot \frac{3}{2}$

$$p = 21$$

Ex. 9: $9 = -\frac{3}{4} m$

Ex. 9: $-8 = \frac{4}{5} v$

Ex. 10: In the 2004 Olympics, Shawn Crawford won the 200 m dash. His time was 19.79 seconds. Find his average speed to the nearest tenth of a meter per second.

Homework: