

Distributive Property review

$$3(x+5) = 3 \left(\begin{array}{|c|c|c|c|c|} \hline x & 1 & 1 & 1 & 1 \\ \hline \end{array} \right) = \begin{array}{|c|c|c|c|c|} \hline x & 1 & 1 & 1 & 1 \\ \hline x & 1 & 1 & 1 & 1 \\ \hline x & 1 & 1 & 1 & 1 \\ \hline \end{array} = 3x + 15$$

$$2(y-3) = 2 \left(\begin{array}{|c|c|c|c|} \hline y & -1 & -1 & -1 \\ \hline \end{array} \right) = \begin{array}{|c|c|c|c|} \hline y & -1 & -1 & -1 \\ \hline y & -1 & -1 & -1 \\ \hline \end{array} = 2y + (-6) \\ 2y - 6$$

Lesson 6-5 More Two-Step Equations

An equation in the form $p(x + q) = r$ contains two factors, p and $(x + q)$ and is considered a two-step equation.

Example 1

Solve $6(x + 2) = 42$. Check your solution.

$$\boxed{6(x+2)}$$

$$\begin{aligned} 6(x + 2) &= 42 \\ \frac{6(x + 2)}{6} &= \frac{42}{6} \\ x + 2 &= 7 \\ -2 &= -2 \\ x &= 5 \end{aligned}$$

Write the equation.

Division Property of Equality
Simplify.

Subtraction Property of Equality
Simplify.

Check

$$\begin{aligned} 6(x + 2) &= 42 \\ 6(5 + 2) &\stackrel{?}{=} 42 \\ 6(7) &\stackrel{?}{=} 42 \\ 42 &= 42 \checkmark \end{aligned}$$

Write the original equation.
Replace x with 5.
Add. Multiply.
The solution checks.

The solution is 5.

Example 2

Solve $\frac{4}{5}(x - 5) = 4$. Check your solution.

$$\begin{aligned} \frac{4}{5}(x - 5) &= 4 \\ \frac{5}{4} \cdot \frac{4}{5}(x - 5) &= \frac{5}{4} \cdot 4 \\ (x - 5) &= \frac{5}{4} \cdot \frac{4}{1} \\ x - 5 &= 5 \\ +5 &= +5 \\ x &= 10 \end{aligned}$$

Write the equation.

Multiplication Property of Equality

$\frac{5}{4} \cdot \frac{4}{5} = 1$; write 4 as $\frac{4}{1}$.

Simplify.

Addition Property of Equality

Simplify.

Check

$$\begin{aligned} \frac{4}{5}(x - 5) &= 4 \\ \frac{4}{5}(10 - 5) &= 4 \\ \frac{4}{5}(5) &= 4 \checkmark \end{aligned}$$

Write the original equation.
Replace x with 10.
Subtract then multiply.
The solution checks.

$$\begin{aligned} 7. \quad \boxed{\frac{9}{7} \cdot \frac{7}{9}}(x+5) &= 21 \cdot \frac{9}{7} \\ x+5 &= 27 \\ -5 &= -5 \\ x &= 22 \end{aligned}$$

The solution is 10.

Exercises

Solve each equation.

$$\begin{aligned} 7(3+4) &= 49 \\ 7(7) &= 49 \\ 49 &= 49 \end{aligned}$$

$$\begin{aligned} 1. \quad \boxed{\frac{7}{7}}(x+4) &= \frac{49}{7} \\ (x+4) &= 7 \\ -4 &= -4 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 4. \quad \boxed{\frac{25}{25}}(x-3) &= \frac{175}{25} \\ x-3 &= 7 \end{aligned}$$

$$5. \quad \frac{3}{4}(x - 12) = 3$$

$$7. \quad \frac{7}{9}(x + 5) = 21$$

$$\begin{aligned} \frac{7}{9}(22+5) &= 21 \\ \frac{7}{9}(27) &= 21 \\ 7 \cdot 3 &= 21 \\ 21 &= 21 \end{aligned}$$

Lesson 5 Skills Practice

More Two-Step Equations

Solve each equation. Check your solution.

1. $3(x + 5) = 39$

2. $7(x + 8) = 49$

7. $\frac{4}{9}(x + 13) = 8$

8. $\frac{9}{10}(x + 8) = 18$

17. $-\frac{1}{8}(x - 4) = -4$

18. $\frac{2}{5}(x - 16) = -6$

21. $\frac{3}{5}(x - 19) = -15$

22. $0.1(x + 7) = 3.5$

23. $-2.8(x + 4.9) = 18.2$

24. $6.5(x - 4) = 19.5$