

8th Grade Math Solving Simple Equations

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1.1 Lesson

Remember
Addition and subtraction are inverse operations.
Opposite

Key Ideas

Addition Property of Equality
Words Adding the same number to each side of an equation produces an equivalent equation.
Algebra If $a = b$, then $a + c = b + c$.

Subtraction Property of Equality
Words Subtracting the same number from each side of an equation produces an equivalent equation.
Algebra If $a = b$, then $a - c = b - c$.

To stay equal: must do the same to both sides of the equal sign. (like a scale)

EXAMPLE 1 Solving Equations Using Addition or Subtraction

Look at variable side
Do opposite

a. Solve $x - 7 = -6$.

$x - 7 = -6$
Write the equation.
Undo the subtraction. $+7$ $+7$
Addition Property of Equality
 $x = 1$
Simplify.

\therefore The solution is $x = 1$.

Check
 $x - 7 = -6$
 $1 - 7 \stackrel{?}{=} -6$
 $-6 = -6$ ✓

b. Solve $y + 3.4 = 0.5$.

$y + 3.4 = 0.5$
Write the equation.
Undo the addition. -3.4 -3.4
Subtraction Property of Equality
 $y = -2.9$
Simplify.

Check
 $y + 3.4 = 0.5$
 $-2.9 + 3.4 \stackrel{?}{=} 0.5$
 $0.5 = 0.5$ ✓

2
-3.4
5
-2.9

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b. Solve $y + 3.4 = 0.5$.

Undo the addition. $y + 3.4 = 0.5$ Write the equation.
 $\xrightarrow{-3.4} \quad -3.4 \quad -3.4$ Subtraction Property of Equality
 $y = -2.9$ Simplify

Check
 $y + 3.4 = 0.5$
 $-2.9 + 3.4 \stackrel{?}{=} 0.5$
 $0.5 = 0.5$

∴ The solution is $y = -2.9$.

c. Solve $h + 2\pi = 3\pi$.

Undo the addition. $h + 2\pi = 3\pi$ Write the equation.
 $\xrightarrow{-2\pi} \quad -2\pi \quad -2\pi$ Subtraction Property of Equality
 $h = \pi$ Simplify

Reminder: Think of π (π) as a value not a variable!

∴ The solution is $h = \pi$.

Chapter 1 Equations Created with Doceri

Remember
 Multiplication and division are inverse operations.

Key Ideas

Multiplication Property of Equality
Words Multiplying each side of an equation by the same number produces an equivalent equation.
Algebra If $a = b$, then $a \cdot c = b \cdot c$.

Division Property of Equality
Words Dividing each side of an equation by the same number produces an equivalent equation.
Algebra If $a = b$, then $a \div c = b \div c$, $c \neq 0$.

EXAMPLE 2 Solving Equations Using Multiplication or Division

a. Solve $-\frac{3}{4}n = -2$.

Look at variable side
 Opposite of fraction is flipped fraction (reciprocal)
 Use the reciprocal. $-\frac{3}{4}n = -2$ Write the equation.
 $\xrightarrow{\cdot \frac{4}{3}} \quad \frac{4}{3} \cdot (-\frac{3}{4}n) = \frac{4}{3} \cdot (-2)$ Multiplication Property of Equality
 $n = \frac{8}{3}$ Simplify. **Reminder:**
 $- \cdot - = +$
 $+ \cdot - = -$

∴ The solution is $n = \frac{8}{3}$.

b. Solve $\pi x = 3\pi$.

Look at variable side
 $\frac{\pi}{\pi} = 1$
 Undo the multiplication. $\pi x = 3\pi$ Write the equation.
 $\xrightarrow{\div \pi} \quad \frac{\pi}{\pi} x = \frac{3\pi}{\pi}$ Division Property of Equality
 $x = 3$ Simplify.

Check
 $\pi x = 3\pi$
 $\pi(3) \stackrel{?}{=} 3\pi$
 $3\pi = 3\pi$ ✓

∴ The solution is $x = 3$.

On Your Own
 Solve the equation. Check your solution.

Now You're Ready Exercises 18–26

7. $\frac{y}{4} = -7$ 8. $6\pi = \pi x$ 9. $0.09w = 1.8$

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Record and Practice Journal

BIG IDEAS MATH

- Activity Recording Journal
- Activity Manipulatives
- Extra Practice Worksheets
- Fair Game Review Worksheets
- Glossary

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Copy and complete for Credit!

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1.1 Practice
For use after Lesson 1.1

Solve the equation. Check your solution.

1. $x + 5 = 16$
 $-5 = -5$
 $x = 11$

2. $11 = w - 12$
 $+12 = +12$
 $23 = w$

3. $\frac{3}{4} + z = \frac{5}{6}$

4. $y = \frac{18}{3}$
 $y = 6$

5. $\frac{k}{7} = 10$
 $k = 70$

6. $\frac{4}{5}n = \frac{9}{10}$

7. $x - (12 + 6) = 9$
 $x - 18 = 9$
 $+18 = +18$
 $x = 27$

8. $h + |-8| = 15$
 $h + 8 = 15$
 $-8 = -8$
 $h = 7$

9. $1.3(2) + p = 7.9$

← multiply $\frac{1.3}{1.3} \times 2$

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Last problem is EC for trying!