

Name:

Date:

Period:

## Lesson: Solving Equations – Variable on Both Sides

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### How can you solve an equation with the variable on both sides?

Equations with the variable on both sides can be used to compare costs of real-world situations. To solve these equations, use inverse operations to get the variable terms on one side of the equation.

**Example:**

Solve  $3x - 9 = 6x$ . Check your solution.

Solve each equation.

1)  $6r + 7 = 13 + 7r$

2)  $13 - 4x = 1 - x$

Three more examples: Solve each equation for the unknown variable.

$7a - 3 = 3 + 6a$

$n + 2 = -14 - n$

Solve  $4a - 7 = 5 - 2a$ .

Write an equation to represent each relationship. Then solve the equation.

9. Two less than 3 times a number is the same as the number plus 10.

11. Twenty less than 8 times a number is the same as 15 more than the number.

10. A number increased by 4 is the same as 19 minus 2 times the number.

Wisdom Lane Middle School

Math - Grade 8

Mr. Tomeo

A water tank holds 256 gallons but is leaking at a rate of 3 gallons per week. A second water tank holds 384 gallons but is leaking at a rate of 5 gallons per week. After how many weeks will the amount of water in the two tanks be the same?



Derrick's Dog Sitting and Darlene's Dog Sitting are competing for new business. The companies ran the ads shown.

a. Write and solve an equation to find the number of hours for which the total cost will be the same for the two services.

b. **Analyze Relationships** Which dog sitting service is more economical to use if you need 5 hours of service? Explain.

12. The charges for an international call made using the calling card for two phone companies are shown in the table.

Phone Company	Charges
Company A	35¢ plus 3¢ per minute
Company B	45¢ plus 2¢ per minute

a. What is the length of a phone call that would cost the same no matter which company is used?

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b. **Analyze Relationships** When is it better to use the card from Company B?

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### Extra Equations to Practice:

#### Exercises

Solve each equation. Check your solution.

1.  $6s - 10 = s$

2.  $8r = 4r - 16$

3.  $25 - 3u = 2u$

4.  $14t - 8 = 6t$

5.  $k + 20 = 9k - 4$

6.  $11m + 13 = m + 23$

7.  $-4b - 5 = 3b + 9$

8.  $6y - 1 = 27 - y$

9.  $1.6h - 72 = 4h - 30$

10.  $8.5 - 3z = -8z$

11.  $10x + 8 = 5x - 3$

12.  $16 - 7d = -3d + 2$