

2-4 Equations and Their Solutions

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An **equation** is a mathematical statement that two quantities are equal. You can think of a correct equation as a balanced scale.



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Equations may contain variables. If a value for a variable makes an equation true, that value is a **solution** of the equation.

$s + 15 = 27$

$s = 12$

$s = 12$ is a solution
because $12 + 15 = 27$.

$s = 10$

$s = 10$ is not a solution
because $10 + 15 \neq 27$.

$25 \neq 27$

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Determine whether the given value of the variable is a solution.

$$b - 447 = 1,203 \text{ for } b = 1,650$$

$$1,650 - 447 \stackrel{?}{=} 1,203$$

$$1,203 = 1,203 \checkmark$$

This is a sol.

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Determine whether the given value of the variable is a solution.

$$u + 56 = 139 \text{ for } u = 73$$

$$73 + 56 \stackrel{?}{=} 139$$

$$129 \neq 139 \text{ X}$$

NOT a sol.

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Determine whether the given value of the variable is a solution.

$$45 \div g = 3 \text{ for } g = 15$$

$$45 \div 15 \stackrel{?}{=} 3$$

$$3 = 3 \checkmark$$

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Determine whether the given value of the variable is a solution.

$$27x = 1,485 \text{ for } x = 54$$

$$27 \cdot 54 \stackrel{?}{=} 1,485$$

$$1,458 \neq 1,485 \text{ X}$$

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Determine whether the given value of the variable is a solution.

$$s \div 4 = 5, \text{ when } s = 24$$

$$24 \div 4 \stackrel{?}{=} 5$$

$$6 \neq 5 \text{ X}$$

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Determine whether the given value of the variable is a solution.

$$b \cdot 5 = 20, \text{ when } b = 3$$

$$3 \cdot 5 \stackrel{?}{=} 20$$

$$15 \neq 20$$

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Paulo says that his yard is 19 yards long. Jamie says that Paulo's yard is 664 inches long. Determine if these two measurements are equal.

$$36 \cdot \text{yd} = \text{in.}$$

$$36 \cdot 19 = 664$$

$$684 \neq 664$$

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Anna says that the table is 7 feet long. John says that the table is 84 inches long. Determine if these two measurements are equal.

$$12 \cdot \text{ft} = \text{in.}$$

$$12 \cdot 7 = 84$$

$$84 = 84 \checkmark$$

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Determine whether the given value of each variable is a solution.

1. $85 = 13x$ for $x = 5$

2. $w + 38 = 210$ for $w = 172$

3. $8y = 88$ for $y = 11$

4. $16 = w \div 6$ for $w = 98$

5. The local pizza shop charged Kylee \$172 for 21 medium pizzas. The price of a medium pizza is \$8. Determine if Kylee paid the correct amount of money. (Hint: $\$8 \cdot \text{pizzas} = \text{total cost.}$)

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