

Solving equations by multiplying or dividing**Solving Linear Equations**

When solving equations for a particular variable, use the multiplication or division property of equality. The multiplication property means that multiplying the same nonzero number by both sides of the equation will produce an equivalent equation.

$$\frac{x}{7} = 3 \quad \text{Multiply both sides of the equation by 7 to get } x \text{ by itself.}$$

$$(7)\left(\frac{x}{7}\right) = (7)(3) \quad \text{Check } \frac{21}{7} = 3$$

$$x = 21 \quad 3 = 3 \quad \text{true statement}$$

Thus, the solution is 21.

The division property means that dividing both sides of the equation by the same nonzero number will produce an equivalent equation.

$$-5x = 20 \quad \text{Divide both sides of the equation by } -5 \text{ to get } x \text{ by itself.}$$

$$\frac{-5x}{-5} = \frac{20}{-5} \quad \text{Check } -5(-4) = 20$$

$$x = -4 \quad 20 = 20 \quad \text{true statement}$$

Thus, the solution is -4.

Solve each equation for x . Check your answers.

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|------------------------|------------------------|-------------------------|
| 1. $5x = 35$ | 2. $18 = -3x$ | 3. $-7x = 49$ |
| 4. $-\frac{1}{3}x = 6$ | 5. $-5x = -20$ | 6. $-\frac{5}{8}x = 10$ |
| 7. $\frac{1}{4}x = -2$ | 8. $\frac{2}{3}x = 8$ | 9. $4 = -\frac{x}{5}$ |
| 10. $-4x = 48$ | 11. $\frac{x}{3} = -5$ | 12. $-6x = 24$ |

Translate each problem into an equation. Solve each equation.

13. Joe worked 21 hours on his class project. He worked 3 times as long as Mary did. How long did Mary work on her project?
14. Eight times a number is -96. Find the number.
15. John spent $\frac{2}{3}$ of his savings on a new radio. The radio cost \$80. How much was John's savings before he bought the radio?