

WORKSHEET 3.3: SOLVING EQUATIONS BY MULTIPLYING OR DIVIDING

Follow the steps below to solve an equation by multiplying or dividing:

1. Isolate the variable on one side of the equation by multiplying or dividing both sides of the equation by the same nonzero number.
2. Find the value of the variable.

EXAMPLES

Solve each equation.

$$7x = -28 \quad \text{Divide each side by 7.} \quad \longrightarrow \quad \frac{7x}{7} = \frac{-28}{7}; x = -4$$

$$-\frac{3}{4}x = 15 \quad \text{Multiply each side by } -\frac{4}{3}. \quad \longrightarrow \quad -\frac{4}{3} \left(-\frac{3}{4}x \right) = -\frac{4}{3} \times \frac{15}{1}; x = -20$$

DIRECTIONS: Write the number you would use to multiply or divide both sides of the equation. Then solve the equation.

1. $6a = -42$

2. $\frac{x}{9} = -18$

3. $-\frac{1}{3}x = 12$

4. $24y = -8$

5. $-n = 100$

6. $15 = \frac{1}{3}d$

7. $-\frac{3}{5}x = -60$

8. $24 = -\frac{a}{2}$

9. $26 = -13x$

10. $\frac{y}{6} = 12$

11. $\frac{3}{4}x = 24$

12. $-20 = -2y$



CHALLENGE: Martin solved the equation $-2x = 20$ by dividing both sides of the equation by -2 . Brianna solved the equation by multiplying both sides by $-\frac{1}{2}$. Who is correct? Explain your answer.

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Follow the steps below to solve an equation by multiplying or dividing:

1. Isolate the variable on one side of the equation by multiplying or dividing both sides of the equation by the same nonzero number.
2. Find the value of the variable.

EXAMPLES

Solve each equation.

$7x = -28$ Divide each side by 7.

$$\rightarrow \frac{7x}{7} = \frac{-28}{7}; x = -4$$

$-\frac{3}{4}x = 15$

Multiply each side by $-\frac{4}{3}$.

$$\rightarrow -\frac{4}{3} \left(-\frac{3}{4}x \right) = -\frac{4}{3} \times \frac{15}{1}; x = -20$$

$-\frac{4}{3}$ is the reciprocal of $-\frac{3}{4}$

DIRECTIONS: Write the number you would use to multiply or divide both sides of the equation. Then solve the equation.

1. $6a = -42$

divide by 6
 $a = -7$

2. $\frac{x}{9} = -18$

multiply by 9
 $x = -162$

3. $-\frac{1}{3}x = 12$

multiply by -3
 $x = -36$

4. $24y = -8$

divide by 24
 $y = -\frac{1}{3}$

5. $-n = 100$

multiply by -1
 $n = -100$

6. $15 = \frac{1}{3}d$

multiply by 3
 $d = 45$

7. $-\frac{3}{5}x = -60$

multiply by $-\frac{5}{3}$
 $x = 100$

8. $24 = -\frac{a}{2}$

multiply by -2
 $a = -48$

9. $26 = -13x$

divide by -13
 $x = -2$

10. $\frac{y}{6} = 12$

multiply by 6
 $y = 72$

11. $\frac{3}{4}x = 24$

multiply by $\frac{4}{3}$
 $x = 32$

12. $-20 = -2y$

divide by -2
 $y = 10$



CHALLENGE: Martin solved the equation $-2x = 20$ by dividing both sides of the equation by -2 . Brianna solved the equation by multiplying both sides by $-\frac{1}{2}$. Who is correct? Explain your answer.

Both students are correct. Dividing both sides by -2 is the same as multiplying both sides by $-\frac{1}{2}$.