

Solve 2-Step Equations

Scenario	Anticipate the Answer	Write and Solve Algebraic Equations
George starts his day with \$5. He earns \$7 per hour at his job. At the end of the day, he has \$47. How many hours did he work?	6 hours $7 \cdot 6 = 42$ $42 + 5 = 47$ $47 - 5 = 42$ $42 \div 7 = 6$	$h = \text{hours worked}$ $7h + 5 = 47$ $\frac{-5}{-5} \quad \frac{-5}{-5}$ $\frac{7h}{7} = \frac{42}{7}$ $h = 6$
Ms. Draper has a pack of pencils. She splits the pack into 4 groups. Then she takes away 2 pencils from a group, and that group is left with 5 pencils. How many pencils were originally in the pack?	28 $28 = 7$ $\frac{28}{4}$ $7 - 2 = 5$	$P = \text{Pencils}$ $\frac{P}{4} - 2 = 5$ $\frac{+2}{+2} \quad \frac{+2}{+2}$ $\frac{P}{4} = 7$ $\frac{P}{4} = 7 \cdot 4$ $P = 28$

Model Equations with Algebra Tiles

Model	Algebra	Words
	<p>1) $2x - 3 = 5$</p> $\begin{array}{r} +3 +3 \\ \hline 2x = 8 \\ \hline \frac{2x}{2} = \frac{8}{2} \\ \hline x = 4 \end{array}$	<p>What's the constant term? -3</p> <p>How do we make it zero? +3</p> <p>What's the coefficient? times 2</p> <p>How do we make it one? divide by 2</p>
	<p>2) $-1 = 3x + 5$</p> $\begin{array}{r} -6 -6 \\ \hline -7 = 3x \\ \hline \frac{-7}{3} = \frac{3x}{3} \\ \hline -\frac{7}{3} = x \end{array}$	<p>What's the constant term? +5</p> <p>How do we make it zero? -5</p> <p>What's the coefficient? Times 3</p> <p>How do we make it one? divide by 3</p>

	<p>3) $\frac{x}{2} + 4 = 1$</p> <p>-1 -4</p> <p>$\cdot \frac{x}{2} = -3 \cdot 2$</p> <p>$x = -6$</p>	<p>What's the constant term? +4</p> <p>How do we make it zero? -4</p> <p>What's the coefficient? divide by 2</p> <p>How do we make it one? mult by 2</p>
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Solve Equations with Fractions

Example	Words	You Try
<p>4) $-\frac{4}{5}x = 16$</p> <p>$(-\frac{5}{4})(-\frac{4}{5}x) = 16(-\frac{5}{4})$</p> <p>$\frac{20}{20}x = \frac{-80}{4}$</p> <p>$1x = -20$</p>	<p>What fraction do we have? $-\frac{4}{5}x$</p> <p>How can we cancel the fraction so the variable's coefficient will be one? mult. by $-\frac{5}{4}$</p>	<p>6) $-\frac{3}{4}y = 9$</p> <p>$(-\frac{4}{3})(-\frac{3}{4}y) = 9(-\frac{4}{3})$</p> <p>$\frac{12}{12}y = \frac{-36}{3}$</p> <p>$1y = -12$</p>
<p>5) $\frac{4}{3}b = -2$</p> <p>-1 -4</p> <p>$(-\frac{3}{4})(\frac{4}{3}b) = (-\frac{6}{1})(-\frac{2}{1})$</p> <p>$\frac{4}{4}b = \frac{18}{2}$</p> <p>$1b = 9$</p> <p>$b = 9$</p>	<p>What's the constant term? 4</p> <p>How do we make it zero? $\frac{-4}{2}$ -4</p> <p>What's the coefficient? $-\frac{2}{3}$</p> <p>How do we make it one? $-\frac{3}{2}$</p>	<p>7) $\frac{5}{6}c - 6 = 14$</p> <p>$5c = 36 = 84$</p> <p>$5c = 84 + 36$</p> <p>$\frac{5c}{5} = \frac{120}{5}$</p> <p>$c = 24$</p>

Key Ideas

We use inverse operations to make our equation become $|x + 0 = \# \Rightarrow x = \#$

FIRST: We use additive inverses to make the constant term equal zero.

SECOND: We multiply or divide to make the variable's coefficient equal one.

If we have fractions, we multiply both sides by the reciprocal!

To do that, we flip the fraction and multiply across.