Lesson 3-2

Example 1 Solve by Adding a Positive Number
Solve $y - 12 = -21$. Then check your solution.

$y - 12 = -21$	Original equation
$y - 12 + 12 = -21 + 12$	Add 12 to each side.
$y = -9$	$-12 + 12 = 0$ and $-21 + 12 = -9$.

To check that –9 is the solution, substitute –9 for y in the original equation.

Check	$y - 12 = -21$	Original equation
	$-9 - 12 \stackrel{?}{=} -21$	Substitute –9 for y.
	$-21 = -21$	Subtract.

The solution is –9.

Example 2 Solve by Adding a Negative Number
Solve $27 - p = 13$. Then check your solution.

$27 - p = 13$	Original equation
$27 + -p + (-27) = 13 + (-27)$	Add –27 to each side.
$-p = -14$	$27 + (-27) = 0$ and $13 + (-27) = -14$.
$p = 14$	Multiply both sides by –1.

Check	$27 - p = 13$	Original equation
	$27 - 14 \stackrel{?}{=} 13$	Substitute 14 for p.
	$13 = 13$	Add.

The solution is 14.

Example 3 Solve by Subtracting
Solve $k + \frac{4}{5} = -\frac{1}{3}$. Then check your solution.

$k + \frac{4}{5} = -\frac{1}{3}$	Original equation
$k + \frac{4}{5} - \frac{4}{5} = -\frac{1}{3} - \frac{4}{5}$	Subtract $\frac{4}{5}$ from each side.
$k = -\frac{17}{15}$	$\frac{4}{5} - \frac{4}{5} = 0$ and $-\frac{1}{3} - \frac{4}{5} = -\frac{17}{15}$.

Check	$k + \frac{4}{5} = -\frac{1}{3}$	Original equation
	$-\frac{17}{15} + \frac{4}{5} = -\frac{1}{3}$	Substitute $-\frac{17}{15}$ for k.
	$-\frac{1}{3} = -\frac{1}{3}$	Add.

The solution is $-\frac{17}{15}$.

Example 4 Solve by Adding or Subtracting
Solve $m + 4.65 = -3.82$ in two ways.

Method 1 Use the Subtraction Property of Equality.

$m + 4.65 = -3.82$ Original equation

$m + 4.65 - 4.65 = -3.82 - 4.65$ Subtract 4.65 from each side.

$m = -8.47$ $4.65 - 4.65 = 0$ and $-3.82 - 4.65 = -8.47$.

The solution is –8.47.

Method 2 Use the Addition Property of Equality.

$m + 4.65 = -3.82$ Original equation

$m + 4.65 + (-4.65) = -3.82 + (-4.65)$ Add –4.65 to each side.

$m = -8.47$ $4.65 + (-4.65) = 0$ and $-3.82 + (-4.65) = -8.47$.

The solution is –8.47.

Example 5 Write and Solve an Equation
Write an equation for the problem. Then solve the equation and check your solution.
The difference of a number and one fourth is negative two thirds.

a number	the difference of	one fourth	is	negative two thirds
n	$-$	$\frac{1}{4}$	$=$	$-\frac{2}{3}$

$n - \frac{1}{4} = -\frac{2}{3}$ Original equation

$n - \frac{1}{4} + \frac{1}{4} = -\frac{2}{3} + \frac{1}{4}$ Add $\frac{1}{4}$ to each side.

$n = -\frac{5}{12}$ $-\frac{1}{4} + \frac{1}{4} = 0$ and $-\frac{2}{3} + \frac{1}{4} = -\frac{5}{12}$

Check $n - \frac{1}{4} = -\frac{2}{3}$ Original equation

$-\frac{5}{12} - \frac{1}{4} = -\frac{2}{3}$ Substitute $-\frac{5}{12}$ for n.

$-\frac{2}{3} = -\frac{2}{3}$

The solution is $-\frac{5}{12}$.

Example 6 Write an Equation to Solve a Problem
Noah received a paycheck on Friday. After buying some athletic shoes for $112, he had $96 left. How much was his paycheck?

Words The amount of the paycheck minus the amount of the shoes equals $96.

Variable Let a = amount of paycheck

Equation

The original amount		minus		the amount for shoes		equals		$96
a		-		112		=		96
$a - 112 = 96$				Original equation				
$a - 112 + 112 = 96 + 112$				Add 112 to each side.				
$a = 208$				-112 +112 = 0 and 96 + 112 = 208.				

Noah's paycheck was for $208.