Check Up

1. Solve the following systems by elimination. Verify the solutions.

   a. $2x - 5y = 14$

   $-6x + y = 14$

   b. $2 - \frac{p}{3} = \frac{q}{2}$

   $\frac{5}{3}(2p - 3q) = 10$

The general form works well with the elimination method. If you are not sure how best to rearrange the equations, consider rearranging them to general form.

Compare your answers.

1. Solve the following systems by elimination. Verify the solutions.

   a. $2x - 5y = 14$

   $-6x + y = 14$

$$2x - 5y = 14$$
$$3(2x - 5y) = 3(14)$$
$$6x - 15y = 42$$

$$\begin{array}{rrcl} 6x & -15y & = & 42 \\ +\ (-6x & +\ y & = & 14\ ) \\ \hline 0x & -14y & = & 56 \\ & y & = & -4 \end{array}$$

One x-coefficient is positive and the other is negative. Adding the two equations will eliminate these terms.

$$2x - 5y = 14$$
$$2x - 5(-4) = 14$$
$$2x + 20 = 14$$
$$2x = -6$$
$$x = -3$$

The solution is $x = -3$ and $y = -4$.

Verify the solution.

$2x - 5y = 14$

Left Side	Right Side
$2x - 5y$ $2(-3) - 5(-4)$ 14	14
LS = RS	

$-6x + y = 14$

Left Side	Right Side
$-6x + y$ $-6(-3) + (-4)$ 14	14
LS = RS	

b. $2-\frac{p}{3}=\frac{q}{2}$

$\frac{5}{3}(2p-3q)=10$

The equations are in different formats. Begin by rearranging them into the same format.

$$2-\frac{p}{3}=\frac{q}{2}$$
$$2-\frac{p}{3}-\frac{q}{2}=0$$
$$-\frac{1}{3}p-\frac{1}{2}q+2=0$$
$$-6\left(-\frac{1}{3}p-\frac{1}{2}q+2\right)=-6(0)$$
$$2p+3q-12=0$$

$$\frac{5}{3}(2p-3q)=10$$
$$2p-3q=6$$
$$2p-3q-6=0$$

$$\begin{array}{rrrrrr} & 2p & + & 3q & - & 12 = 0 \\ -\ (& 2p & - & 3q & - & 6 = 0\ ) \\ \hline & 0p & + & 6q & - & 6 = 0 \\ & & & 6q & - & 6 = 0 \\ & & & 6q & & = 6 \\ & & & q & & = 1 \end{array}$$

$$2p+3q-12=0$$
$$2p+3(1)-12=0$$
$$2p=9$$
$$p=\frac{9}{2}$$

The solution is $p=\frac{9}{2}$ and $q=1$.

Verify the solution.

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

Left Side	Right Side
$2 - \frac{p}{3}$	$\frac{q}{2}$
$2 - \frac{\left(\frac{9}{2}\right)}{3}$	$\frac{1}{2}$
$2 - \frac{3}{2}$	
$\frac{1}{2}$	
LS = RS	

$\frac{5}{3}(2p - 3q) = 10$

Left Side	Right Side
$\frac{5}{3}(2p - 3q)$	10
$\frac{5}{3}\left(2\left(\frac{9}{2}\right) - 3(1)\right)$	
10	
LS = RS	