## How to Administer the Quick Check:

- The Quick Check consists of two parts: an Instructor portion which includes solutions and a Student portion with problems for each concept.

- **Your student need only complete the Quick Check problems for the concepts for which you responded Unsure.**

- Have your student complete the Quick Check items independently. You may attempt to clarify the wording of a question, but you should not provide hints about how to solve a problem.

- Return to the Question Block when you have checked your student's work.

- *You should now be able to answer Yes or No for each question.*

- Click **Next** to go to the next screen.

9.1 **Can my student represent linear equations on a graph?**

9.1a **Graph the equation:** $-2x + y = -1$
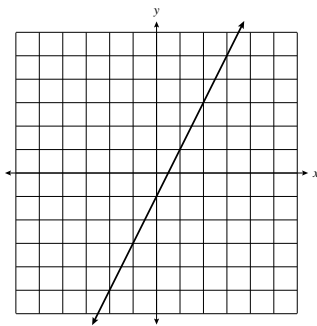
9.1b **Graph the equation:** $y = -\frac{3}{2}x$
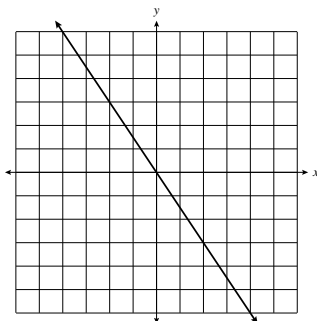
9.2   **Can my student identify the slope and intercept of a linear equation?**

9.2a   **Identify the slope and intercept in the linear equation:** $y = 3x + 2$

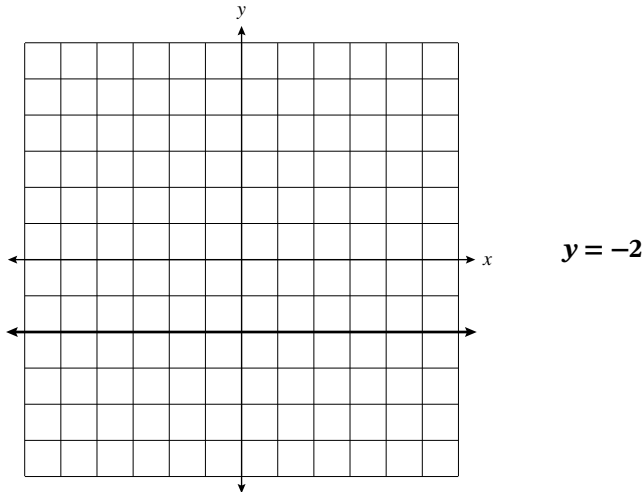Slope: $m = 3$

Intercept: $b = 2$

9.2b   **Identify the slope and intercept in the linear equation:** $5x + y = 10$
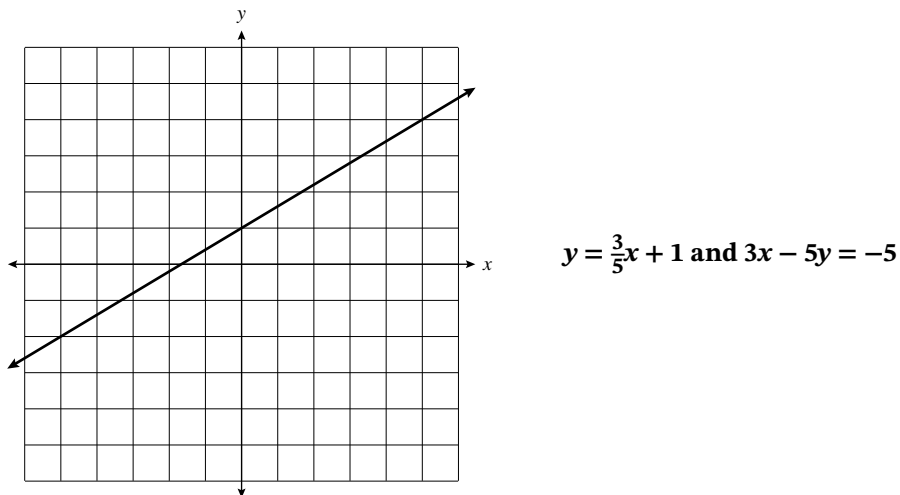
Slope: $m = -5$

Intercept: $b = 10$

9.3 **Can my student write the linear equation represented by a line on a graph?**

9.3a Write the linear equation represented by the line on the graph.

$y = -2$

9.3b Write the linear equation in both slope intercept form and standard form that is represented by the line on the graph.

$y = \frac{3}{5}x + 1$ and $3x - 5y = -5$

9.4 **Can my student solve two-variable systems of equations (simultaneous equations)?**

9.4a **Solve the following system:** $3x - y = 7$
$2x + 3y = 1$

$x = 2$ and $y = -1$

Note: These are sample full solutions. The student may have used any of the following methods: substitution, elimination, or graphing. The student's work may not look exactly as it is written here. The student may have approached the solution differently by solving for the other variable first or beginning with the other equation, etc.

Substitution:

Solve the first equation for y:

$$3x - y = 7$$
$$3x = 7 + y$$
$$3x - y + y = 7 + y$$
$$3x - 7 = 7 - 7 + y$$
$$3x - 7 = y$$
$$\text{or } y = 3x - 7$$

Next, substitute this into the second equation and solve the resulting equation for x:

$$y = 3x - 7$$
$$2x + 3y = 1$$
$$2x + 3(3x - 7) = 1$$
$$2x + 9x - 21 = 1$$
$$11x - 21 = 1$$
$$11x = 22$$
$$x = 2$$

Find the y value of the solution:

$$y = 3x - 7$$
$$y = 3(2) - 7$$
$$y = 6 - 7$$
$$y = -1$$

Elimination:

The first equation can be multiplied by 3 to eliminate the y values and solve for x:

$$(3) \; 3x - y = 7$$
$$\downarrow$$
$$9x - 3y = 21$$

$$9x - 3y = 21$$
$$\underline{+ \; 2x + 3y = 1}$$
$$11x + 0y = 22$$
$$x = 2$$

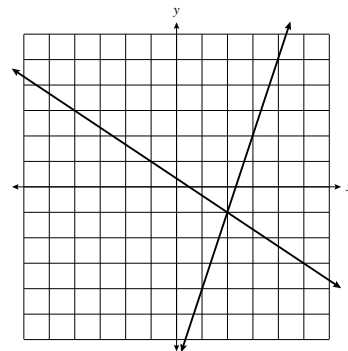Substitute the solution for x into one of the original equations to solve for x:

$$2x + 3y = 1$$
$$2(2) + 3y = 1$$
$$4 + 3y = 1$$
$$3y = -3$$
$$y = -1$$

Graphing:

Intersect: (2, −1)

9.4 **Can my student solve two-variable systems of equations (simultaneous equations)?**

9.4b Solve the following system using a different method than you did in the previous problem:

$$5x + 4y = 1$$
$$3x - 6y = 2$$

$$x = \tfrac{1}{3} \text{ and } y = -\tfrac{1}{6}$$

Note: This is a sample. Your student may have used the same method but approached the solution differently in how they selected the equations for each step.

Substitution:

Solve the second equation for x:

$$3x - 6y = 2$$

$$3x - 6y + 6y = 2 + 6y$$

$$3x = 2 + 6y$$

$$\frac{3x}{3} = \frac{6y + 2}{3}$$

$$x = 2y + \tfrac{2}{3}$$

Next, substitute this into the first equation and solve the resulting equation for y:

$$5x + 4y = 1$$

$$5(2y + \tfrac{2}{3}) + 4y = 1$$

$$10y + \tfrac{10}{3} + 4y = 1$$

$$14y + \tfrac{10}{3} = 1$$

$$14y = 1 - \tfrac{10}{3}$$

$$14y = -\tfrac{7}{3}$$

$$y = (-\tfrac{7}{3})(\tfrac{1}{14})$$

$$y = -\tfrac{1}{6}$$

Find the x value of the solution:

$$3x - 6y = 2$$

$$3x - 6(-\tfrac{1}{6}) = 2$$

$$3x + 1 = 2$$

$$3x = 1$$

$$x = \tfrac{1}{3}$$

Elimination:
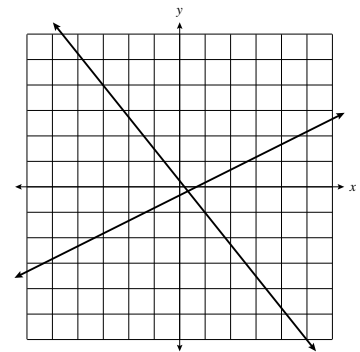
The first equation can be multiplied by 3 and the second equation can be multiplied by 2 to eliminate the y values and solve for x:

$$(3)\ 5x + 4y = 1$$
$$\downarrow$$
$$15x + 12y = 3$$

$$(2)\ 3x - 6y = 2$$
$$\downarrow$$
$$6x - 12y = 4$$

$$\begin{aligned}15x + 12y &= 3\\ +\ \ 6x - 12y &= 4\\ \hline 21x + 0y &= 7\end{aligned}$$

$$21x = 7$$

$$x = \tfrac{7}{21}$$

$$\text{or } x = \tfrac{1}{3}$$

Substitute the solution for x into one of the original equations to solve for y:

$$3x - 6y = 2$$

$$3(\tfrac{1}{3}) - 6y = 2$$

$$1 - 6y = 2$$

$$-6y = 1$$

$$y = -\tfrac{1}{6}$$

Graphing:

Intersect: $(\tfrac{1}{3}, -\tfrac{1}{6})$

Intersect: $(0.\overline{3}, -0.1\overline{6})$

9.5 **Can my student solve quadratic equations with rational roots by factoring?**

9.5a **Solve the equation for x by factoring: $x^2 + 3 = 19$**

$x = \pm 4$

$$x^2 + 3 = 19$$
$$x^2 + 3 - 19 = 19 - 19$$
$$x^2 - 16 = 0$$
$$(x - 4)(x + 4) = 0$$
$$(x - 4) = 0 \text{ and } (x + 4) = 0$$
$$x = 4 \text{ and } x = -4$$

9.5b **Solve the equation for x by factoring: $2x^2 - x - 3 = 0$**

$x = \frac{3}{2}$ or $1\frac{1}{2}$ and $x = -1$

$$2x^2 - x - 3 = 0$$
$$(2x - 3)(x + 1) = 0$$
$$(2x - 3) = 0 \text{ and } (x + 1) = 0$$
$$2x = 3$$
$$x = \frac{3}{2} \text{ or } 1\frac{1}{2} \text{ and } x = -1$$

9.6 **Can my student perform basic arithmetic with binomial and quadratic expressions?**

9.6a $x + 3 \overline{)\,x^2 + 5x + 6}$ Can also be written as: $\dfrac{x^2 + 5x + 6}{x + 3}$

$x + 2$

$$
\begin{array}{r}
x + 2 \\
x + 3 \overline{)\,x^2 + 5x + 6} \\
\underline{-(x^2 + 3x)} \\
2x + 6 \\
\underline{-2x + 6} \\
0
\end{array}
$$

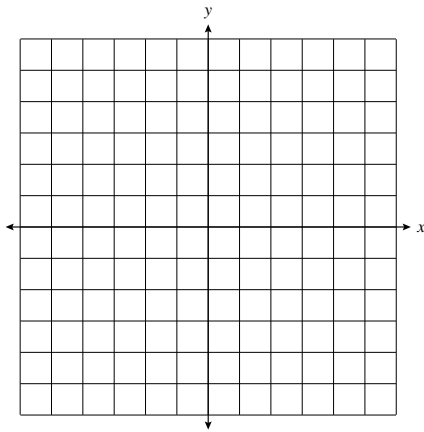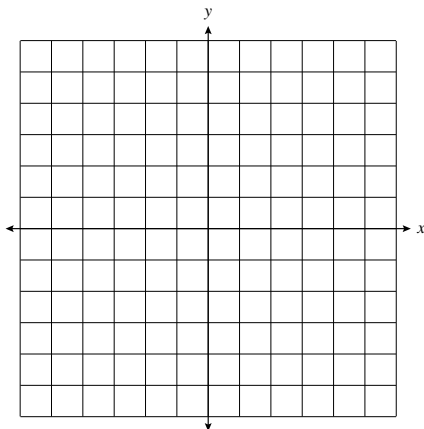**9.6b** $2x - 5 \overline{)\,4x^2 - 2x - 17}$ Can also be written as: $\dfrac{4x^2 - 2x - 17}{2x - 5}$

$2x + 4$ R 3

$$
\begin{array}{r}
2x + 4 \text{R} 3 \text{ or } 2x + 4 + \frac{3}{(2x-5)} \\
2x - 5 \overline{)\,4x^2 - 2x - 17} \\
\underline{-(4x^2 - 10x)} \\
8x - 17 \\
\underline{-(8x - 20)} \\
3
\end{array}
$$

How to complete the Quick Check:

- You only need to complete the problems your parent or instructor assigns.

9.1

9.1a **Graph the equation:** $-2x + y = -1$

9.1b **Graph the equation:** $y = -\frac{3}{2}x$
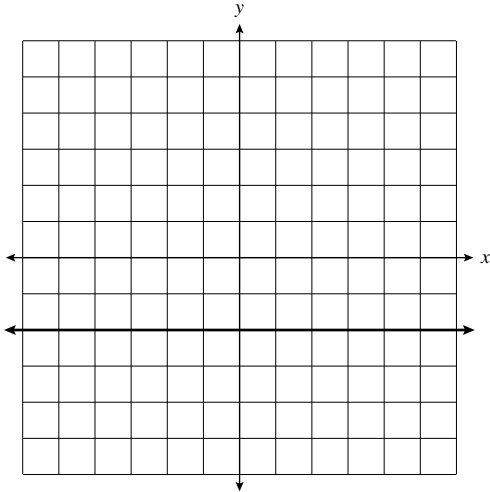
(9.2)

(9.2a) **Identify the slope and intercept in the linear equation:** $y = 3x + 2$
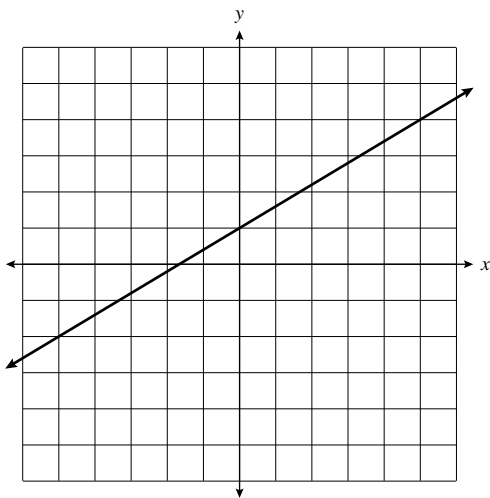
(9.2b) **Identify the slope and intercept in the linear equation:** $5x + y = 10$

9.3

9.3a **Write the linear equation represented by the line on the graph.**

9.3b **Write the linear equation in both slope intercept form and standard form that is represented by the line on the graph.**

(9.4)

(9.4a) **Solve the following system:** $3x - y = 7$
$2x + 3y = 1$

(9.4)

(9.4b) **Solve the following system using a different method than you did in the previous problem:**

$5x + 4y = 1$
$3x - 6y = 2$

(9.5)

(9.5a) **Solve the equation for x by factoring: $x^2 + 3 = 19$**

(9.5b) **Solve the equation for x by factoring: $2x^2 - x - 3 = 0$**

9.6

9.6a $x + 3 \overline{)\, x^2 + 5x + 6}$ Can also be written as: $\dfrac{x^2 + 5x + 6}{x + 3}$

9.6b $2x - 5 \overline{)\, 4x^2 - 2x - 17}$ Can also be written as: $\dfrac{4x^2 - 2x - 17}{2x - 5}$