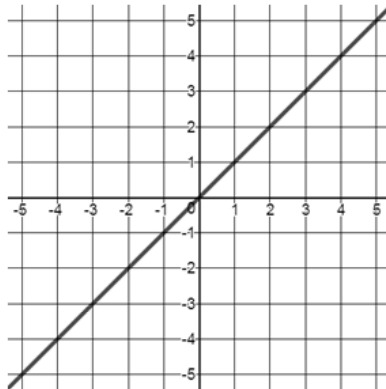


Objective: Graph various functions

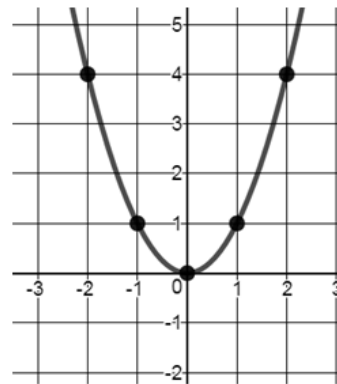
Concept

You can graph most functions quickly using your knowledge of transformations and the parent function.

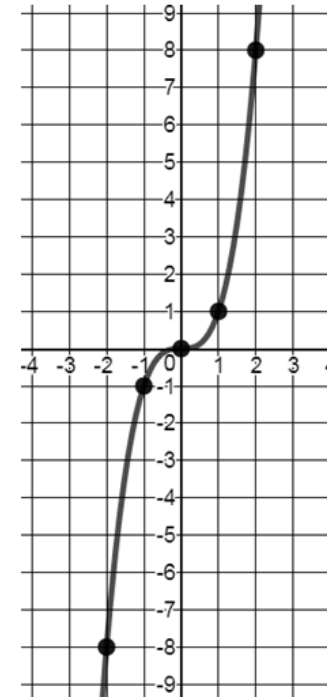
Linear: $y = x$



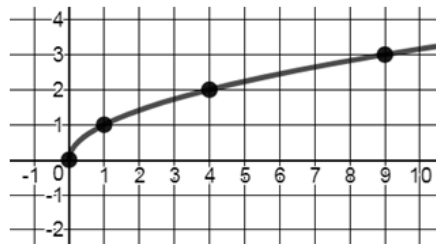
Quadratic: $y = x^2$



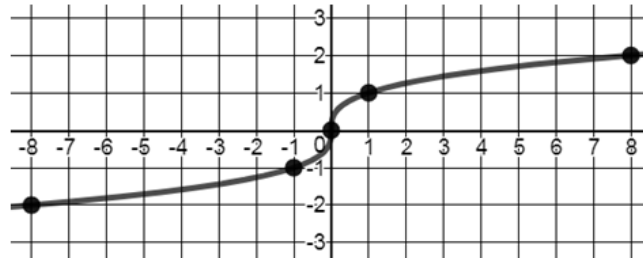
Cubic: $y = x^3$



Square Root: $y = \sqrt{x}$



Cube Root: $y = \sqrt[3]{x}$



Objective: Graph various functions

Graph the function.

$$f(x) = -\frac{4}{3}x + 2$$

What is the domain of this function?

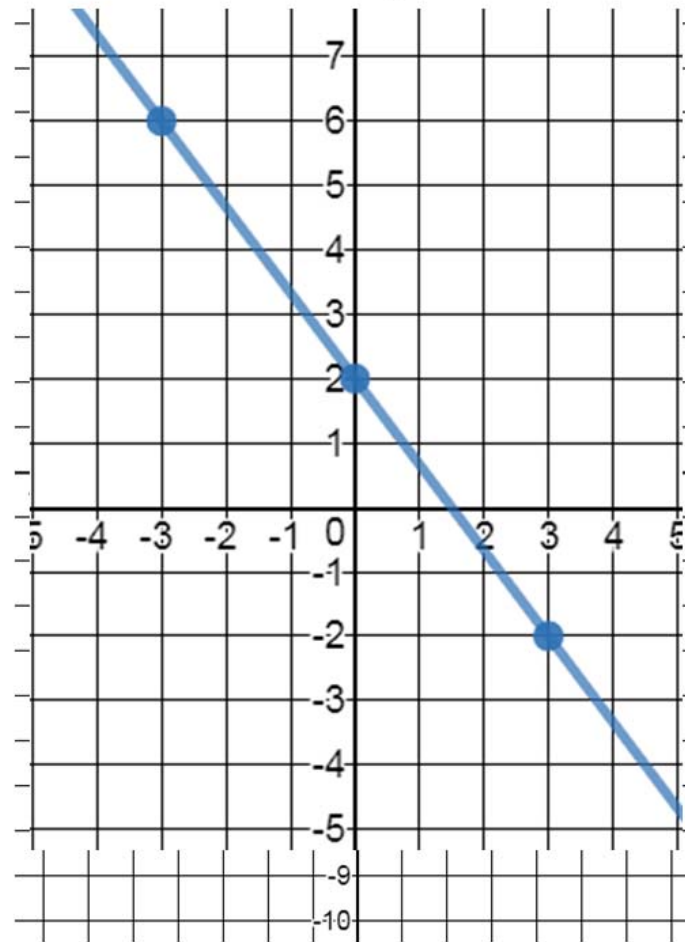
the set of all real numbers

$$\{x \mid -\infty < x < \infty\}$$

$$(-\infty, \infty)$$

Estimate the zero of the function.

$$\text{zero} \approx 1.5$$



Objective: Graph various functions

Graph the function.

$$2y = 4x + 2 \quad \rightarrow \quad y = 2x + 1$$

What is the domain of this function?

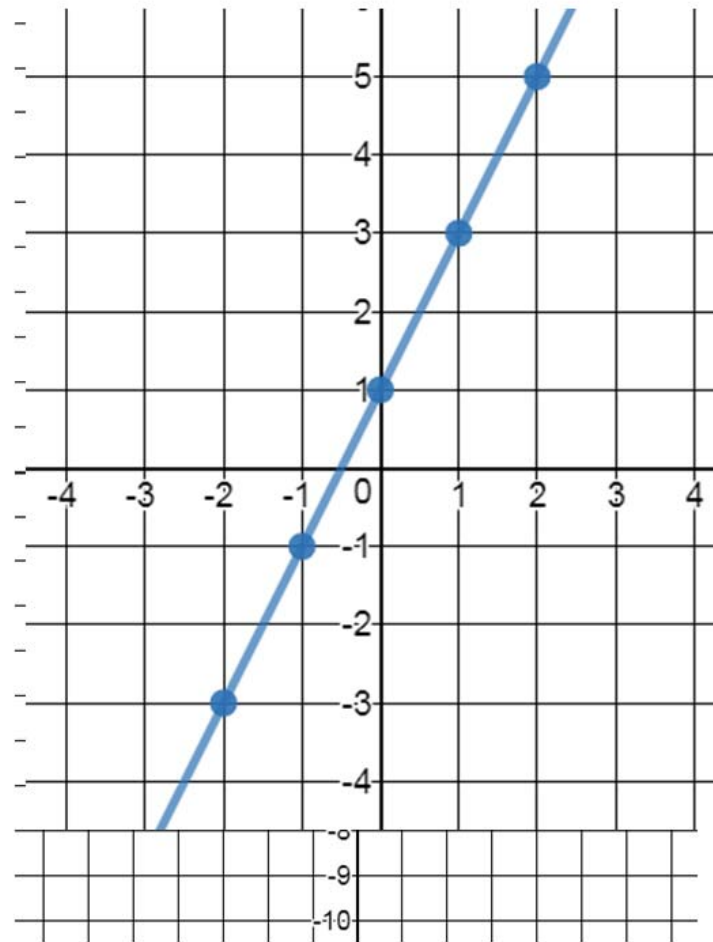
the set of all real numbers

$$\{x \mid -\infty < x < \infty\}$$

$$(-\infty, \infty)$$

Estimate the zero of the function.

$$\text{zero} \approx -0.5$$



Objective: Graph various functions

Graph the function.

$$f(x) = -2x^2 + 2$$

What is the domain of this function?

the set of all real numbers

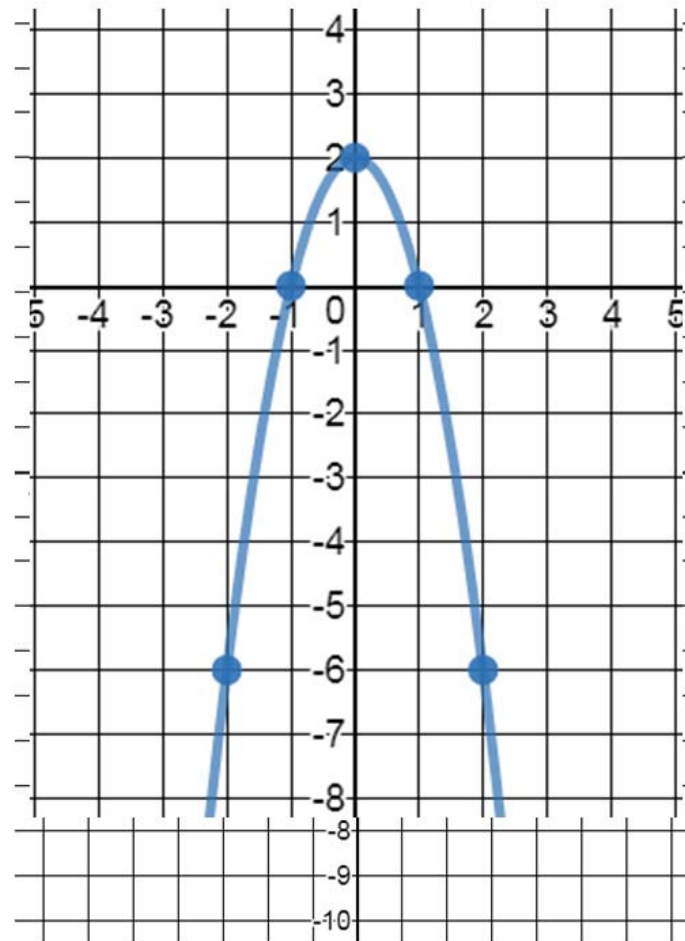
$$\{x \mid -\infty < x < \infty\}$$

$$(-\infty, \infty)$$

What is the range of this function?

$$\{y \mid y \leq 2\}$$

$$(-\infty, 2]$$



Estimate the zeros of the function.

$$\text{zeros} = -1, 1$$

Objective: Graph various functions

Graph the function.

$$f(x) = -\sqrt{x - 3} - 1$$

What is the domain of this function?

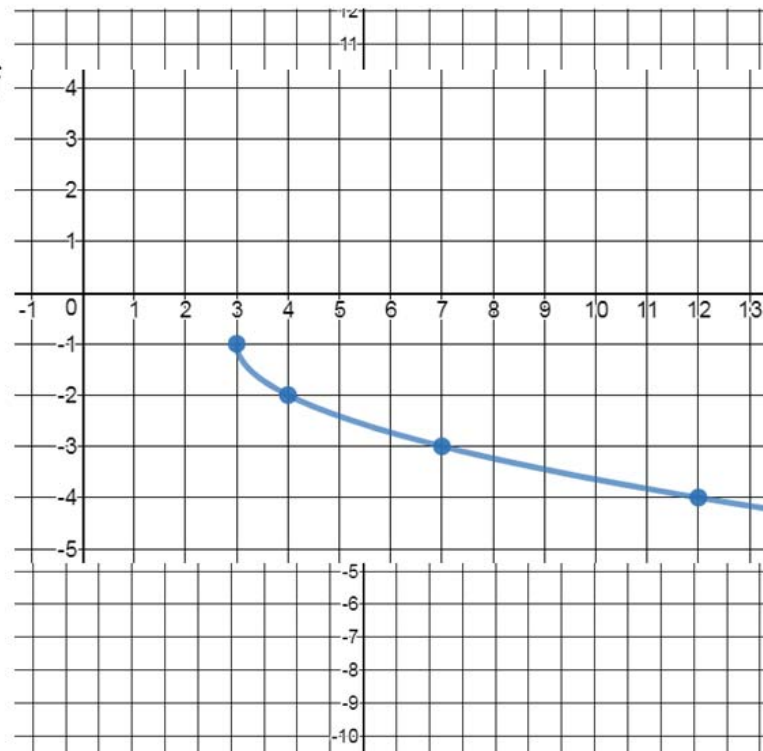
$$\{x | x \geq 3\}$$

$$[3, \infty)$$

What is the range of this function?

$$\{y | y \leq -1\}$$

$$(-\infty, -1]$$



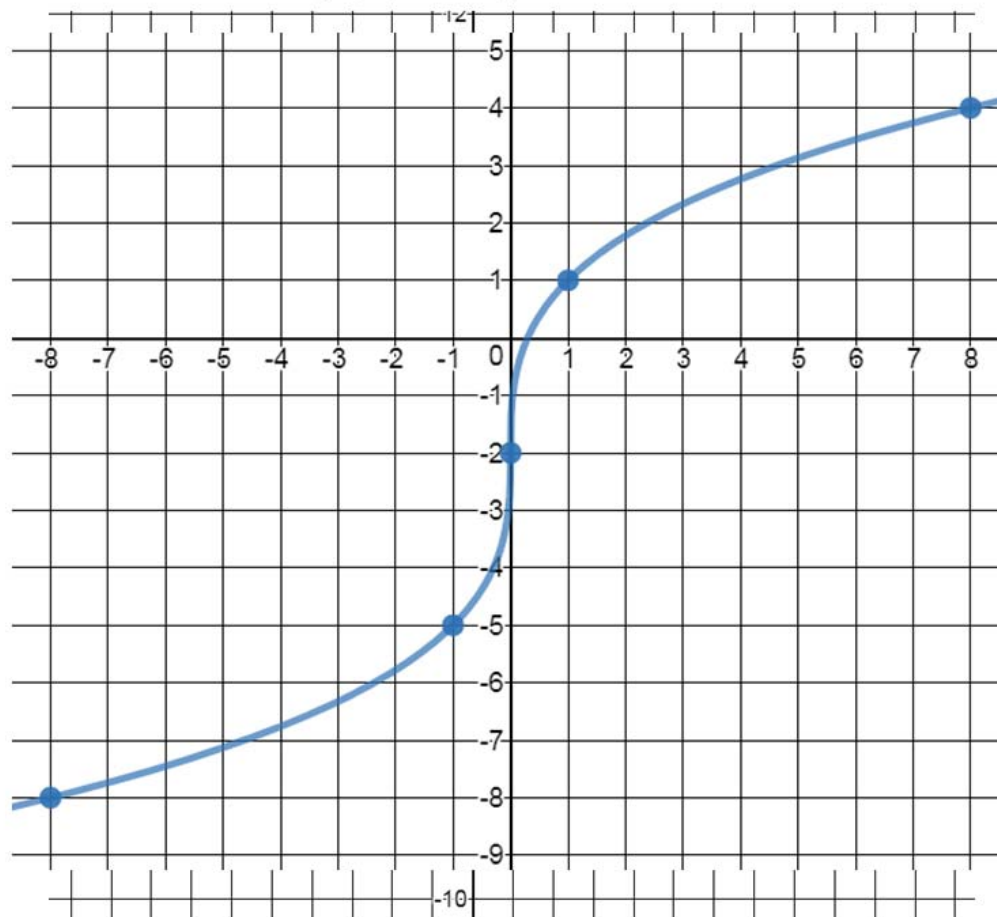
Estimate the zeros of the function.

no zeros

Objective: Graph various functions

Graph the function.

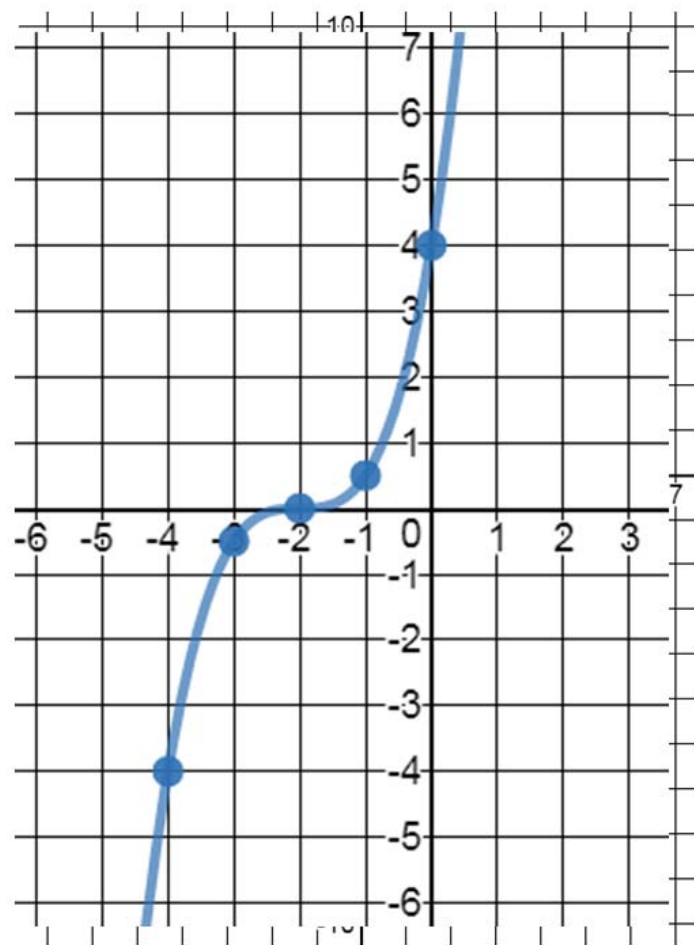
$$f(x) = 3\sqrt[3]{x} - 2$$



Objective: Graph various functions

Graph the function.

$$f(x) = 0.5(x + 2)^3$$



Objective: Graph a system of linear equations or linear inequalities

Concept

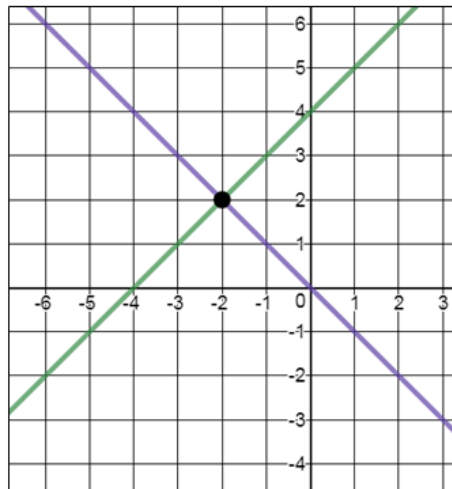
Graphing a System of Linear Equations and Finding the Solution

1. Graph the two lines.
2. State the solution of the system.

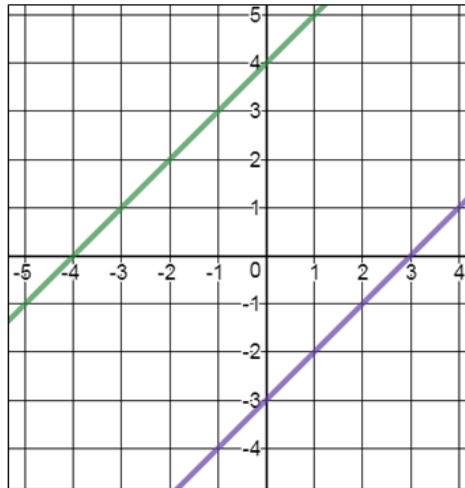
A system of linear equations can have three different types of solutions.

1. **One solution: the point of intersection**
2. **No solution**
3. **Infinitely many solutions**

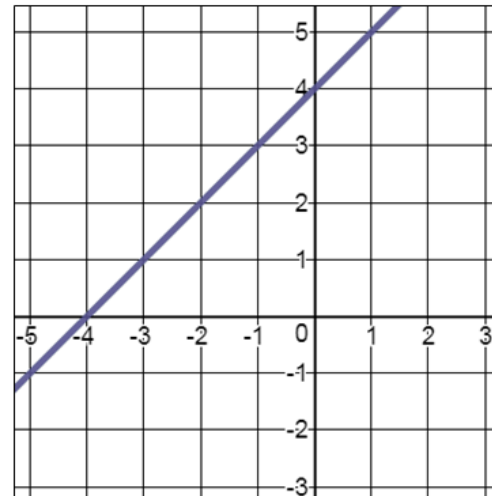
One solution: $(-2, 2)$



No solution



Infinitely Many Solutions



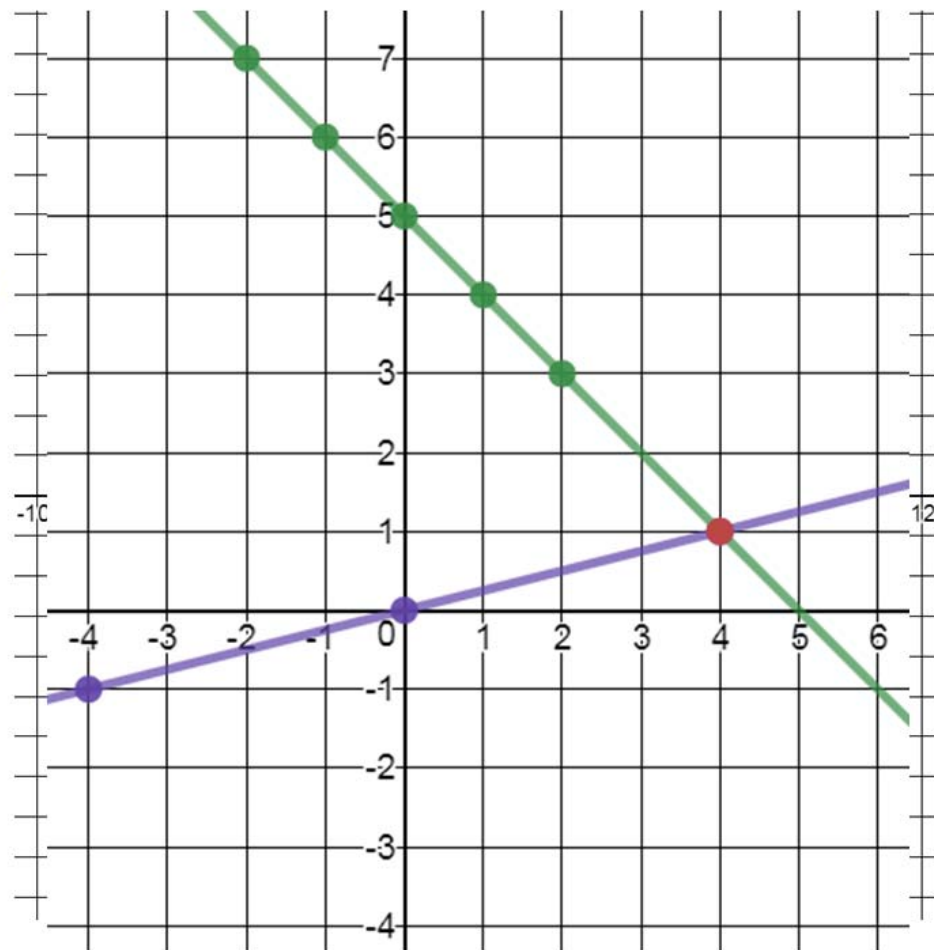
Objective: Graph a system of linear equations or linear inequalities

Graph the system and state the solution.

$$\begin{cases} y = \frac{1}{4}x \\ x + y = 5 \end{cases}$$

↓

$$y = -1x + 5$$



Solution: (4,1)



Objective: Graph a system of linear equations or linear inequalities

Concept

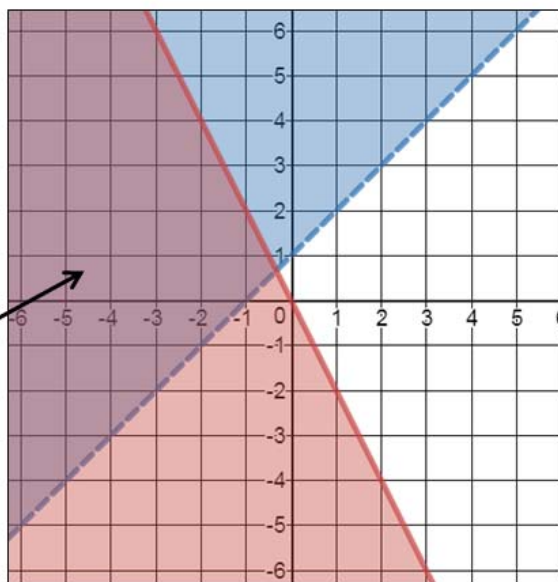
Graphing a System of Linear Inequalities

1. Graph the two lines.
 1. If the inequality is $<$ or $>$, use a dashed line.
 2. If the inequality is \leq or \geq use a solid line.
2. Shade above or below each line.
 1. Choose a point not on the line and plug it into the inequality.
 1. If the statement is true, shade on that side of the line.
 2. If the statement is false, shade on the opposite side of the line.

$$\begin{cases} y > x + 1 \\ y \leq -2x \end{cases}$$

The solution region is where the graphs overlap.

The points in this area are solutions of the system.



Objective: Graph a system of linear equations or linear inequalities

Graph the system.

$$\begin{cases} y \geq -x - 3 \\ y < \frac{3}{2}x \end{cases}$$

