

## Core Content

<b>Cluster Title: Represent and solve equations and inequalities graphically.</b>
<b>Standard A.REI.10:</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
<b>Concepts and Skills to Master</b>
<ul style="list-style-type: none"> <li>Identify solutions and non-solutions of linear and exponential equations.</li> <li>Graph points that satisfy linear and exponential equations.</li> <li>Understand that a continuous curve or a line contains an infinite number of solutions.</li> </ul>

## Supports for Teachers

<b>Critical Background Knowledge</b>	
<ul style="list-style-type: none"> <li>Understand the concept of and be able to plot ordered pairs.</li> <li>Evaluate expressions for given values.</li> </ul>	
<b>Academic Vocabulary</b>	
Ordered pair, coordinate plane, solution, non-solution, sets	
<b>Suggested Instructional Strategies</b>	<b>Resources</b>
<ul style="list-style-type: none"> <li>Create a matching game where students match equations, graphs of equations, and solutions.</li> </ul>	<i>Making it Happen</i> (NCTM)
<b>Sample Formative Assessment Tasks</b>	
<b>Skill-based Task</b>	<b>Problem Task</b>
<ul style="list-style-type: none"> <li>Given a graph of the equation <math>x + 3y = 6</math>, find three solutions that will satisfy the equation.</li> <li>Given a graph representing the growth of a savings account over time with a given rate of return, determine the value of the account after 3 years, 5 years, 10 years, 12 years and 6 months.</li> </ul>	Find all possible solutions to $3x + 2y = 6$ .

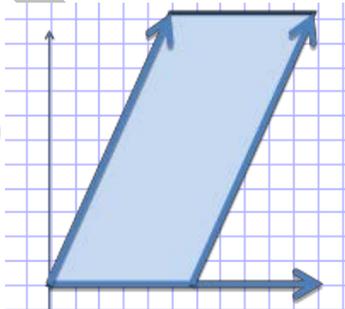
## Core Content

<b>Cluster Title: Represent and solve equations and inequalities graphically.</b>
<b>Standard A.REI.11:</b> Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, or exponential, and logarithmic functions. ★
<b>Concepts and Skills to Master</b>
<ul style="list-style-type: none"> <li>Approximate solutions to systems of two equations using graphing technology.</li> <li>Approximate solutions to systems of two equations using tables of values.</li> <li>Explain why the <math>x</math>-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math> intersect are the solutions of the equation <math>f(x) = g(x)</math>.</li> </ul>

## Supports for Teachers

<b>Critical Background Knowledge</b>	
<ul style="list-style-type: none"> <li>Evaluate expressions.</li> <li>Construct a table of values for a given function.</li> <li>Graph functions using graphing technology.</li> </ul>	
<b>Academic Vocabulary</b>	
Function, intersection, approximate, linear, exponential, $f(x)$ , $g(x)$ .	
<b>Suggested Instructional Strategies</b>	<b>Resources</b>
<ul style="list-style-type: none"> <li>Use graphing technology to approximate the point(s) of intersection of two graphs.</li> <li>Make comparisons between tables of values.</li> </ul>	<a href="http://www.illustrations.NCTM.org">www.illustrations.NCTM.org</a> <ul style="list-style-type: none"> <li>Supply and Demand</li> </ul>
<b>Sample Formative Assessment Tasks</b>	
<b>Skill-based Task</b> Use technology to graph and compare a beginning salary of \$30 per day increased by \$5 each day and a beginning salary of \$0.01 per day, which doubles each day. When are the salaries equal? How do you know?	<b>Problem Task</b> Explain why a company has to sell 100 soccer balls before they will make a profit. The cost of producing a soccer ball is modeled by $C = 10x + 1000$ . The sales price of a soccer ball is \$20.

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<b>Standard A.REI.12:</b> Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	
<b>Concepts and Skills to Master</b>	
<ul style="list-style-type: none"> <li>Graph the solution to linear inequalities in two variables.</li> <li>Graph the solution to systems of linear inequalities in two variables.</li> <li>Identify the solutions as a region of the plane.</li> </ul>	
<b>Supports for Teachers</b>	
<b>Critical Background Knowledge</b>	
<ul style="list-style-type: none"> <li>Graph linear equations.</li> <li>Graph systems of linear equations.</li> <li>Simplify inequalities to represent them in a format that is easy to graph.</li> </ul>	
<b>Academic Vocabulary</b>	
Inequality, solution, half-plane, solution region	
<b>Suggested Instructional Strategies</b>	<b>Resources</b>
<ul style="list-style-type: none"> <li>Use technology to model examples of intersections of inequalities.</li> <li>Use colored pencils to find the region of solutions.</li> </ul>	<a href="http://www.shodor.org">www.shodor.org</a>
<b>Sample Formative Assessment Tasks</b>	
<b>Skill-based Task</b>	<b>Problem Task</b>
Graph the solution set of $x + 2y > 12$ and $3x - y < 9$	 <p>Create a context that represents the shaded area. Write the system of inequalities that models the meaning of the context. Describe the connections between the context, inequalities, and graph.</p>