

Core Content

Cluster Title: Represent and solve equations and inequalities graphically.
Standard: A.REI.10 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).
Concepts and Skills to Master
<ul style="list-style-type: none"> Identify solutions and non-solutions of linear and exponential equations. Graph points that satisfy linear and exponential equations. Understand that a continuous curve or a line contains an infinite number of solutions.

Supports for Teachers

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

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Cluster Title: Represent and solve equations and inequalities graphically.
Standard: A.REI.11 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. ★
Concepts and Skills to Master
<ul style="list-style-type: none"> • Approximate solutions to systems of two equations using graphing technology. • Approximate solutions to systems of two equations using tables of values. • 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 $f(x) = g(x)$. • Be able to express that when $f(x) = g(x)$, the two equations have the same solution(s).

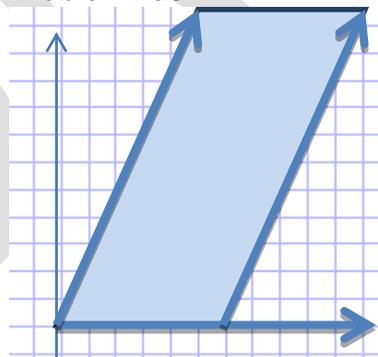
Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> • Evaluate expressions. • Construct a table of values for a given function. • Graph functions using graphing technology. 	
Academic Vocabulary	
Function, intersection, approximate, linear, exponential, $f(x)$, $g(x)$	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> • Use graphing technology to approximate the point(s) of intersection of two graphs. • Make comparisons between tables of values. 	www.illuminations.NCTM.org <ul style="list-style-type: none"> • Supply and Demand
Sample Formative Assessment Tasks	
Skill-based Task	Problem Task
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?	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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Cluster Title: Represent and solve equations and inequalities graphically.
Standard: A.REI.12 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.
Concepts and Skills to Master
<ul style="list-style-type: none"> Graph the solution to linear inequalities in two variables. Graph the solution to systems of linear inequalities in two variables. Identify the solutions as a region of the plane.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> Graph linear equations. Graph systems of linear equations. Simplify inequalities to represent them in a format that is easy to graph. 	
Academic Vocabulary	
Inequality, solution, half-plane, solution region	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Use technology to model examples of intersections of inequalities. Use colored pencils to find the region of solutions. 	<ul style="list-style-type: none"> www.shodor.org
Sample Formative Assessment Tasks	
Skill-based Task	Problem Task
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>