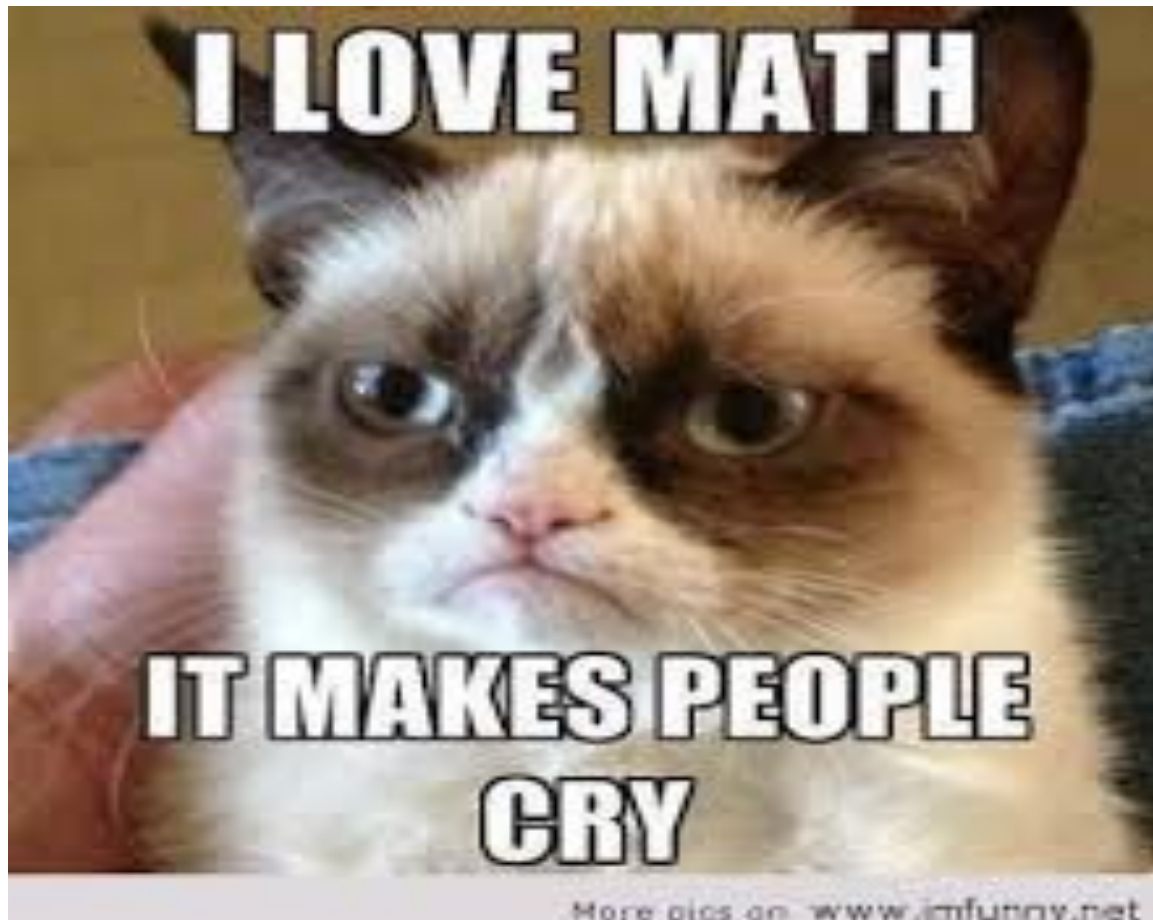# 3.7.1 and 3.7.2 Solving Systems of Equations: Linear and Quadratic

By the end of this lesson, I will be able to answer the following questions...

1. What is a system of equations?

2. What are the methods for solving systems of equations and how do I use them to obtain answers?

3. How can systems of equations be used to model real-world events?

Vocabulary

1. The solution to a system is an ordered pair that satisfies the variables in BOTH equations. Graphically, the solutions to a system of equations is the intersection of the graphs in the system.

2. The solution can also be obtained by setting the equations equal to one another (by substitution) and solving for a variable, then plugging the solved variable back into one of the given equations to reveal the other variable.
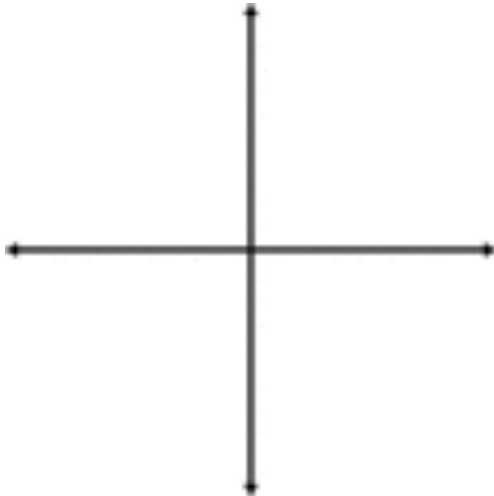
$$\begin{cases} y = -x + 7 \\ y = 2x + 1 \end{cases} \Rightarrow -x + 7 = 2x + 1$$
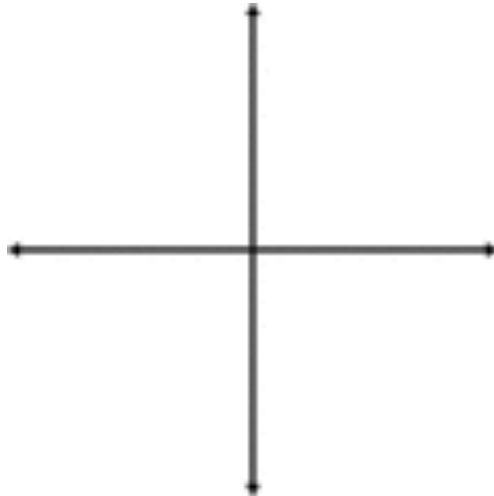

y = -x + 7

intersection ←(2,5)

y = 2x + 1

MathBits.com
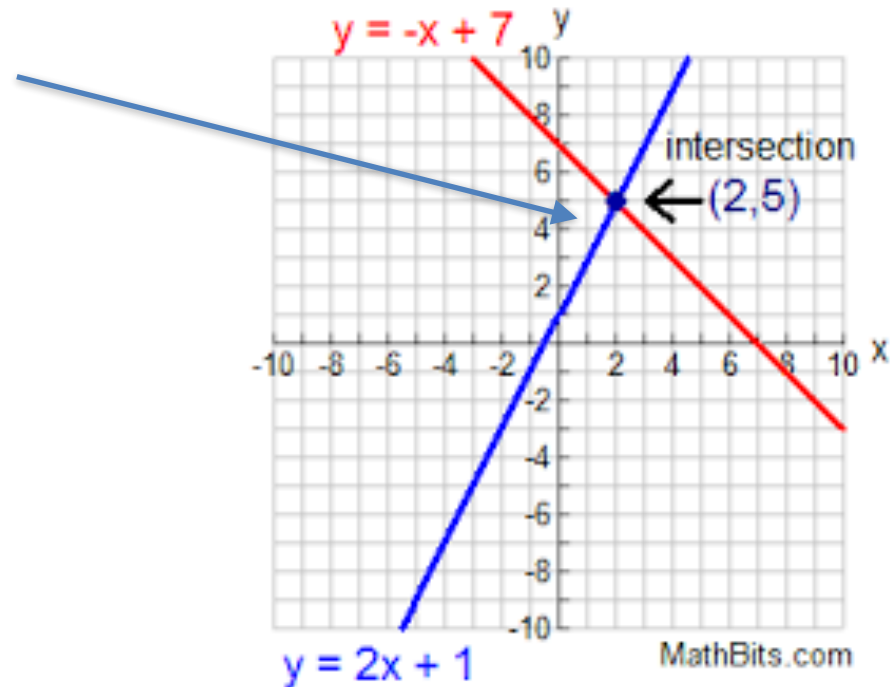
Prerequisite Skills with Practice

Visualizing points of intersect of a system of equations involving a parabola and line…..
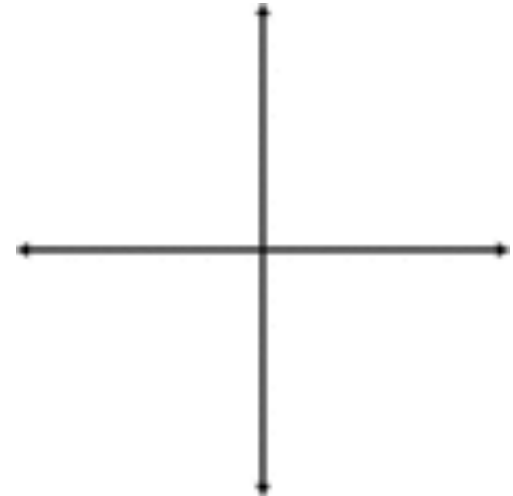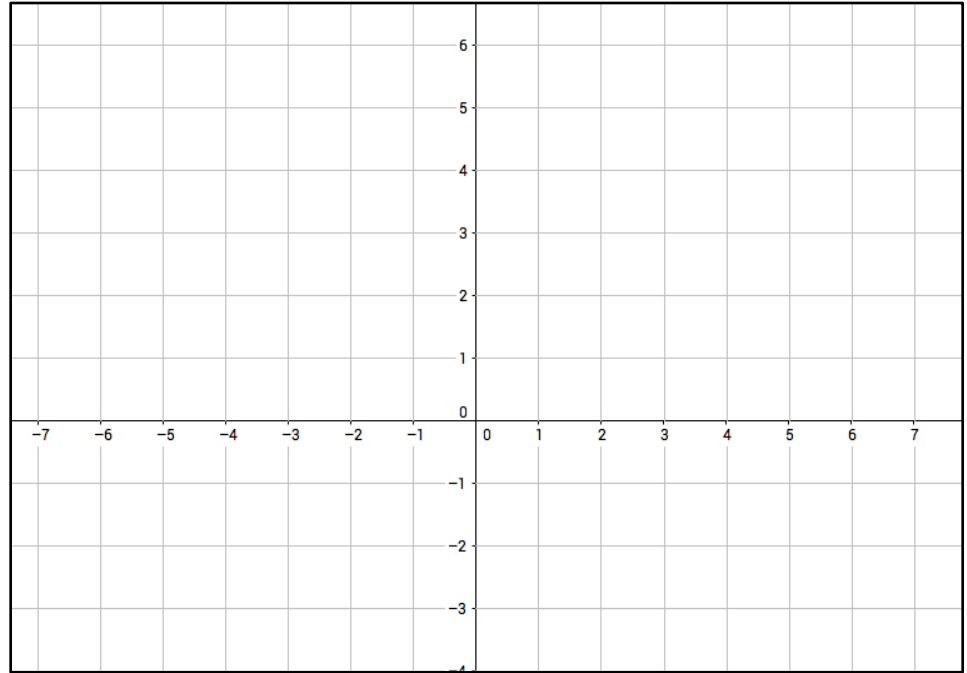
Two Solutions   One Solution   No Solutions

Graph the system of equations below to determine the real solution(s), if any exist.

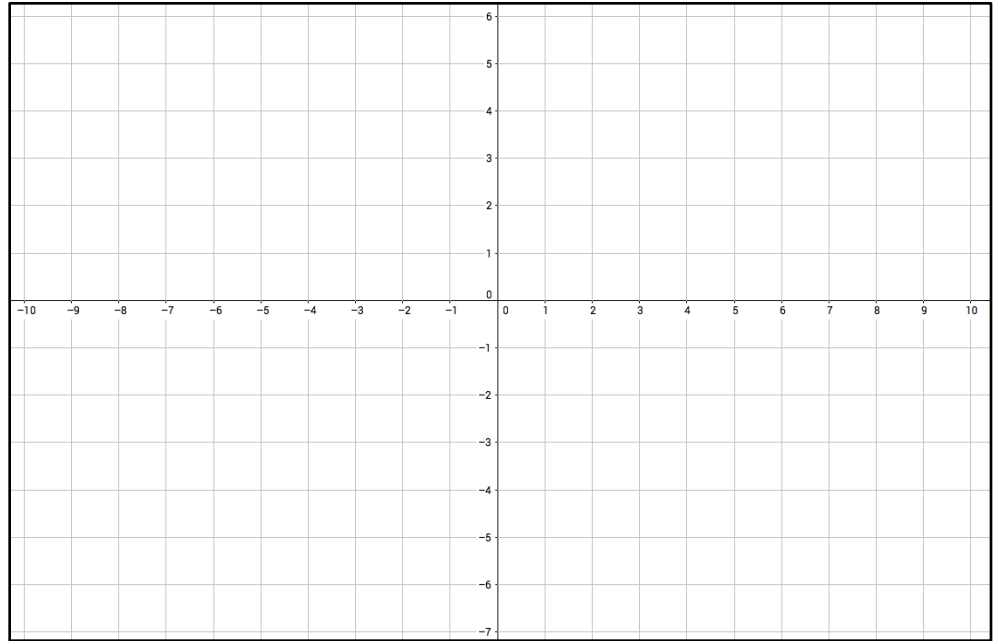$$\begin{cases} y = x^2 + 2x - 2 \\ y = 2x - 2 \end{cases}$$

Solve the system above algebraically by substitution

- Graph the system of equations below to determine the real solution(s), if any exist.

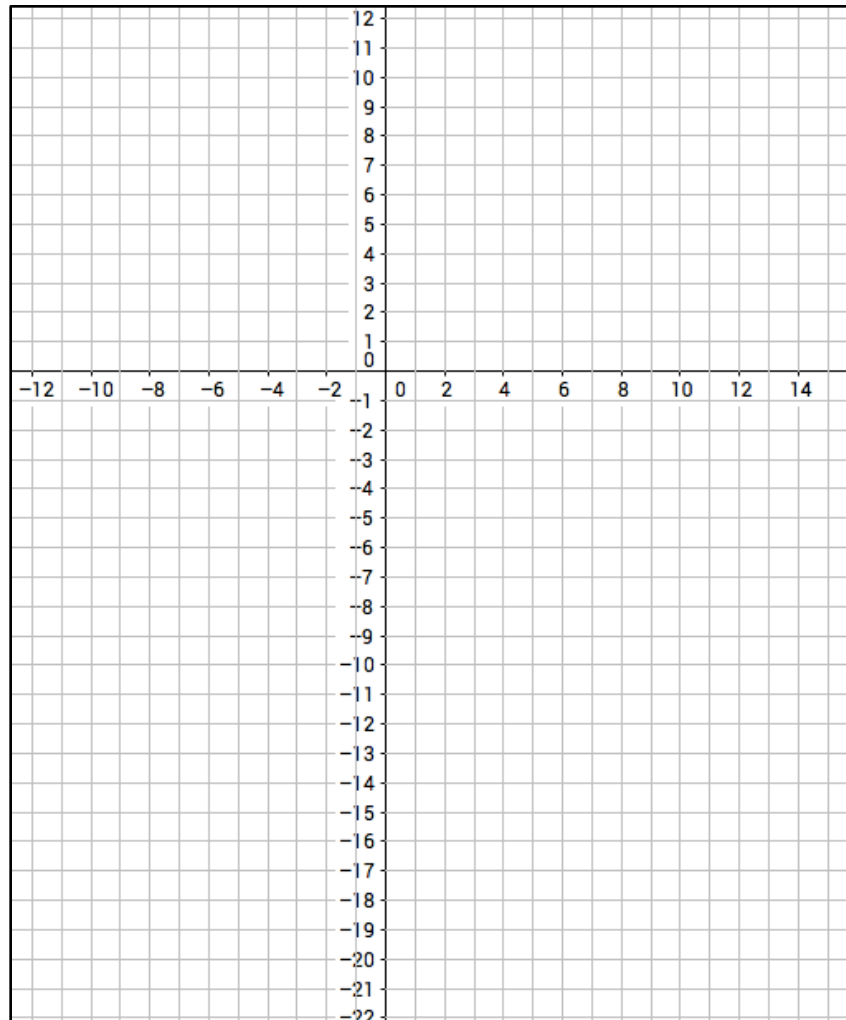$$\begin{cases} y = 3x \\ y = x^2 + 4x - 2 \end{cases}$$

- Solve the system above algebraically by substitution.

- Graph the system of equations below to determine the real solution(s), if any exist.

$$\begin{cases} y = -4x - 10 \\ y = x^2 - 4x - 6 \end{cases}$$

- Solve the system above algebraically by substitution.

A rocket is launched from the ground and follows a parabolic path represented by the equation $y = -x^2 + 10x$. At the same time, a flare is launched from a height of 10 feet and follows a straight path represented by the equation $y = -x + 10$. Using the accompanying set of axes, graph the equations that represent the paths of the rocket and the flare, and find the coordinates of the point or points where the paths intersect.

Confirm your solutions by solving the problem algebraically by substitution.

feet
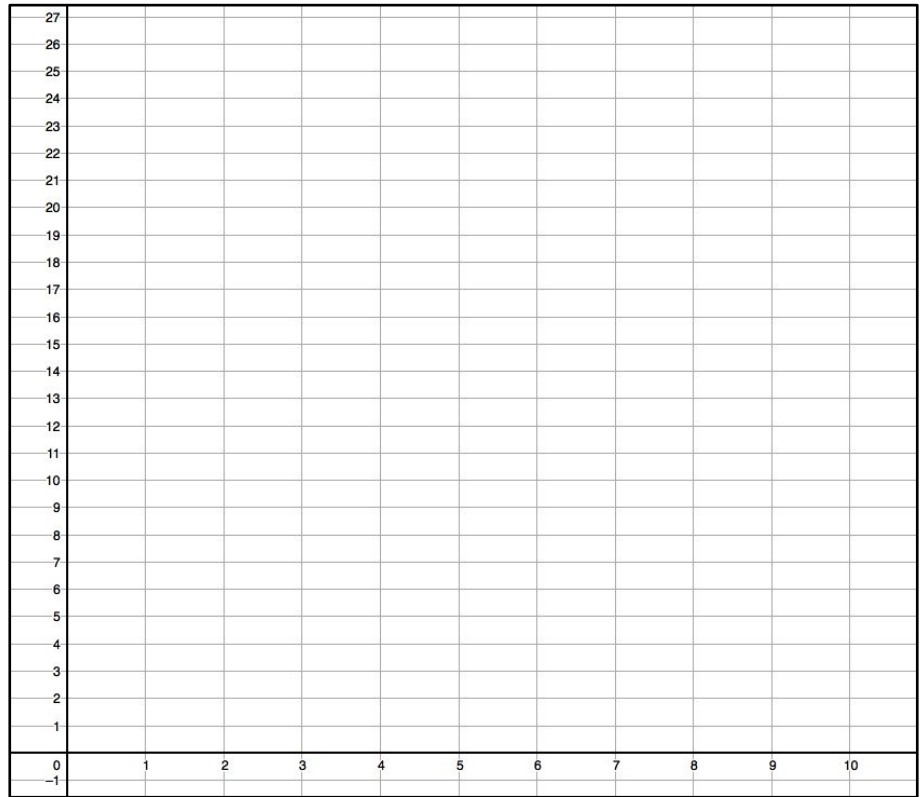
feet

THE END

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