

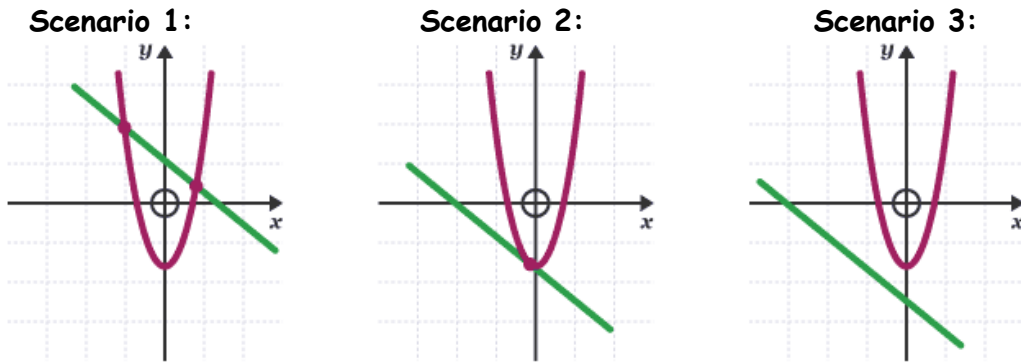
Systems of Linear-Quadratic Equations

Recall:

The graph of a linear equation is a _____.

The graph of a quadratic equation is a _____.

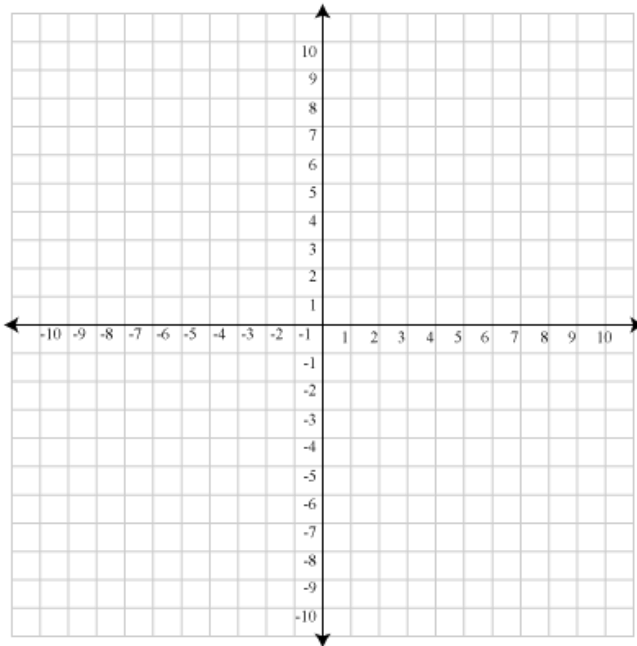
The diagrams below illustrate all the possible scenarios, in terms of intersection points, between a line and a parabola.



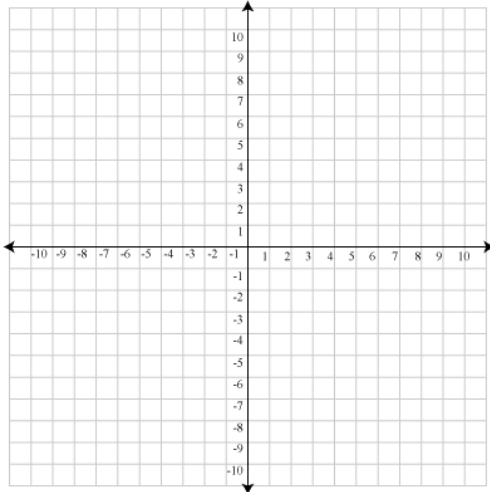
As in the case of a system of two linear equations, the intersection point(s) of a linear equation with a quadratic equation can be found graphically and/or algebraically.

Ex1. Find the point(s) of intersection of the given parabola and line. Solve graphically using desmos and algebraically.

a) $y = -x^2 + 4x + 2$ and $y = x + 2$



b) $y = x^2 + 2x - 3$ and $y = 4x - 4$



Ex2. Determine the number of points of intersection of $y = 3x^2 + 12x + 14$ and $y = 2x - 8$ without solving.

Ex3. The revenue equation for a company is $R(t) = -40t^2 + 300t$, where t is the ticket price in dollars. The cost equation is $C(t) = 1600 - 220t$. Determine the ticket price that will allow the company to break even.

Ex4. Determine the value(s) of k such that the linear equation $y = -5x + k$ does not intersect the parabola $y = -2x^2 + 3x + 1$.