This worksheet is homework. Please keep it with your homework for any homework checks.

Given three points that are not on a line, there is only one parabola $y = ax^2 + bx + c$ that will go through those points. To determine this parabola

- Substitute all three points (x, y) into the equation $y = ax^2 + bx + c$ to obtain a system of three equations for three unknowns (a, b, and c).

- Solve the system to determine a, b, and c.
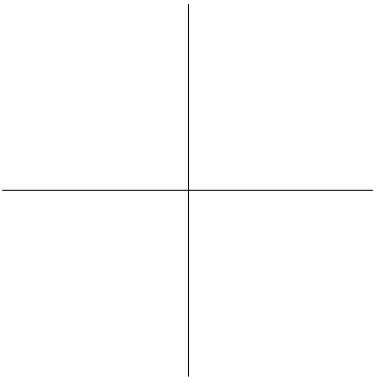
- Write the equation of the parabola.

For each of the following problems,

(a). Graph the points.   **(b).** Use the steps to find the equation for the parabola.   **(c).** Find the vertex and graph the parabola.
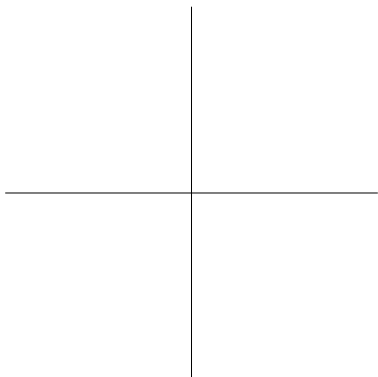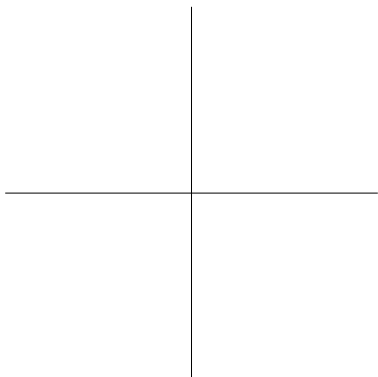
1. $(1, 0),\ (2, 3),\ (-1, 0)$
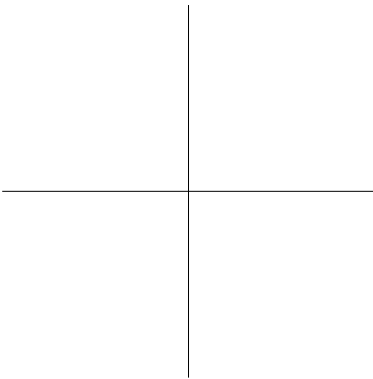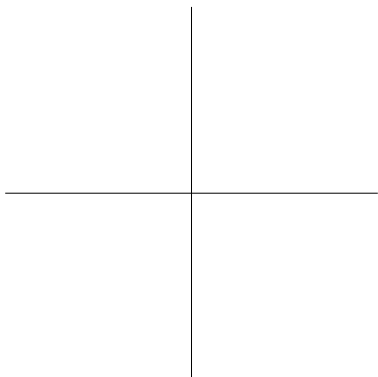
2. $(3, 2),\ (2, 5),\ (1, 4)$

3. $(1, 3)$, $(0, 3)$, $(2, 5)$

4. $(3, 1)$, $(2, 2)$, $(0, 3)$

5. $(7, 4)$, $(-2, 1)$, $(1, 9)$

1. $y = x^2 - 1$ **2.** $y = -2x^2 + 7x - 1$ **3.** $y = x^2 - x + 3$ **4.** $y = -\dfrac{1}{6}x^2 - \dfrac{1}{6}x + 3$ **5.** $y = -\dfrac{7}{18}x^2 + \dfrac{41}{18}x + \dfrac{64}{9}$