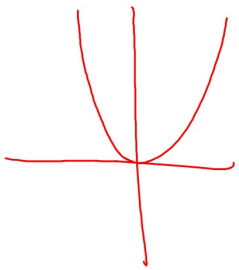
Step 1 Graph $Y_1 = x^2$ in a Standard Window.

Leave this equation in $Y_1$ for the remaining steps.

What are the coordinates of the Vertex? (0,0)



Step 2 Graph $Y_2 = x^2 + 4$.

Describe how this graph is related to the graph of $Y_1 = x^2$ Moved up 4 units

What are the coordinates of the Vertex? (0,4)

Step 3 Graph $Y_2 = x^2 - 6$.

Describe how this graph is related to the graph of $Y_1 = x^2$ Moved down 6 units

What are the coordinates of the Vertex? (0,-6)

Step 4 Graph $Y_2 = -x^2 - 3$.

Describe how this graph is related to the graph of $Y_1 = x^2$ upside down and moved down 3 units

What are the coordinates of the Vertex? (0,-3)

Step 5 Describe how the value of $c$ affects the graph of $y = ax^2 + c$.

The graph moves up c units if +c and down c units if -c

Step 6 Write the equation of the parabola described.

a. The parabola has the same shape as $y = 2x^2$ but has moved 8 units down.

$y = 2x^2 - 8$

b. The parabola has the same shape as $y = 3x^2$ but has moved 2 units up and opens downward.

$y = -3x^2 + 2$

Step 7 Without using a calculator, match each equation below with its graph.

1. $y = 4x^2 - 3$ B
2. $y = -2x^2 + 4$ E
3. $y = x^2 - 3$ A
4. $y = -5x^2 + 4$ D
5. $y = 7x^2 + 4$ C