L4 –Quadratics in Standard Form Unit 5
MPM2D
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Part 1: Vertex from Standard Form Quadratic

Remember that parabolas are symmetrical about the axis of symmetry which is a vertical line that passes through the vertex. Because of this symmetry property, you can find the x-coordinate of the vertex by averaging the x-intercepts.

From quadratic formula we know that the x-intercepts of a standard form quadratic are

$$x = \frac{-b+\sqrt{b^2-4ac}}{2a} \text{ and } x = \frac{-b-\sqrt{b^2-4ac}}{2a}$$

Therefore, the x-coordinate of the vertex is:

Conclusion:

From the standard form equation of a quadratic, $y = ax^2 + bx + c$, you can determine the x-coordinate of the vertex using the formula:

$$x - vertex =$$

Example 1: Find the vertex of the following quadratics

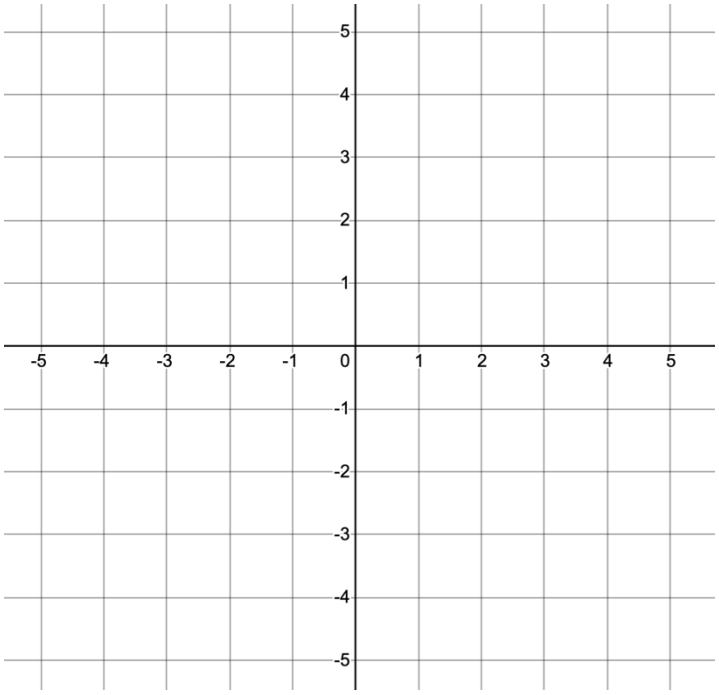
a) $y = x^2 - 6x + 11$

b) $y = -3x^2 + 2x - 1$

Part 2: Putting it all together

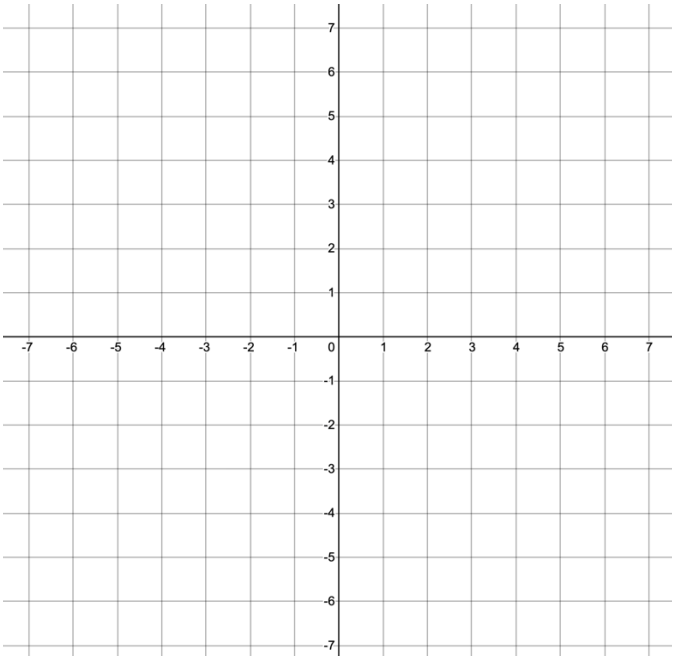
Example 2: For the quadratic $y = -5x^2 + 8x - 3$

a) Find the x-intercepts
b) Find the axis of symmetry
c) Find the vertex
d) Sketch the graph labelling key points



Example 3: For the quadratic $y = 2x^2 - 8x + 11$

a) Find the x-intercepts
b) Find the axis of symmetry
c) Find the vertex
d) Sketch the graph labelling key points



Example 4: For the quadratic $y = x^2 - 10x + 25$

a) Find the x-intercepts
b) Find the axis of symmetry
c) Find the vertex
d) Sketch the graph labelling key points