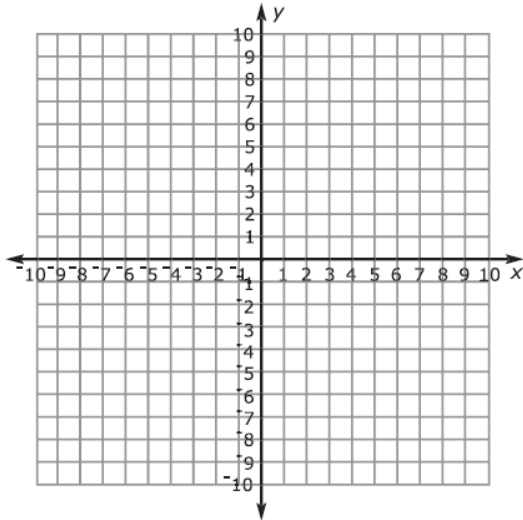


Find the vertex for each quadratic, determine the slope pattern for the quadratic, and then graph the parabola.

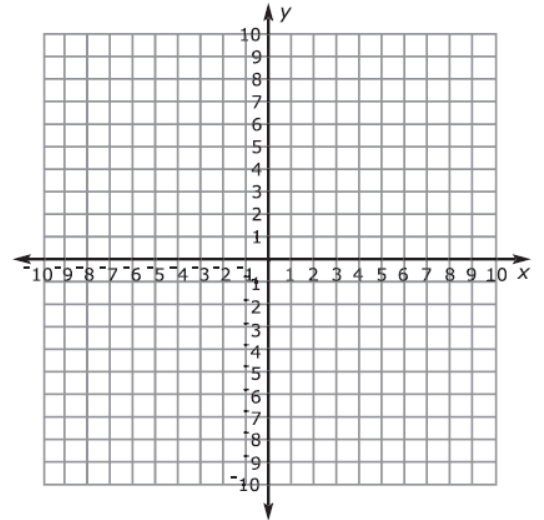
1. $y = x^2 - 2x - 3$



Vertex:

Pattern of Change:

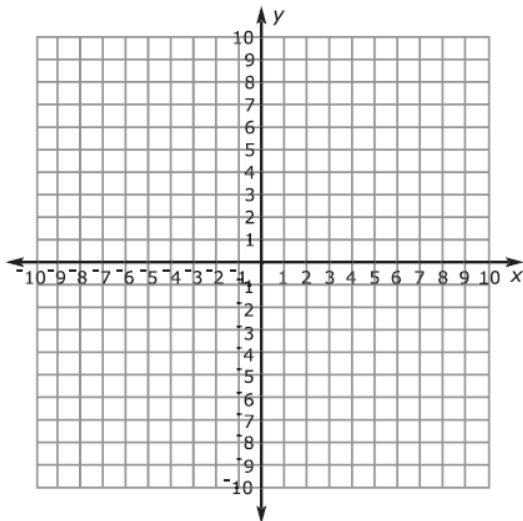
2. $y = x^2 + 8x + 16$



Vertex:

Pattern of Change:

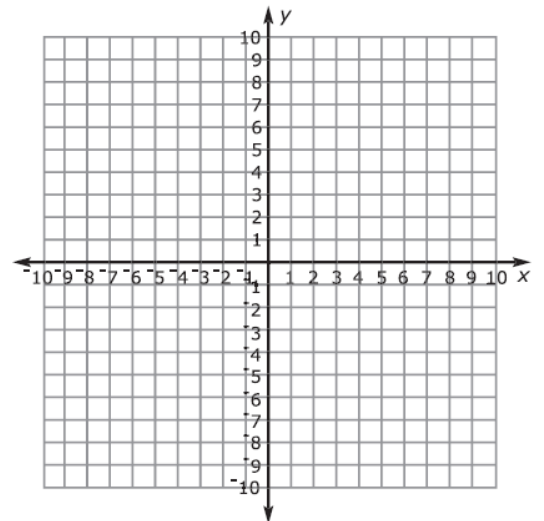
3. $y = 2x^2 + 4x + 1$



Vertex:

Pattern of Change:

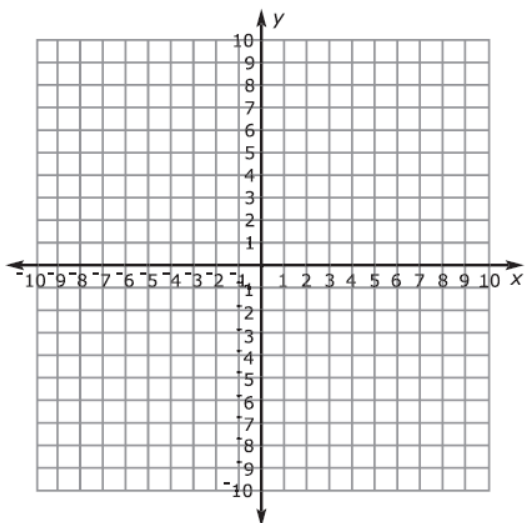
4. $y = 3x^2 - 6x - 2$



Vertex:

Pattern of Change:

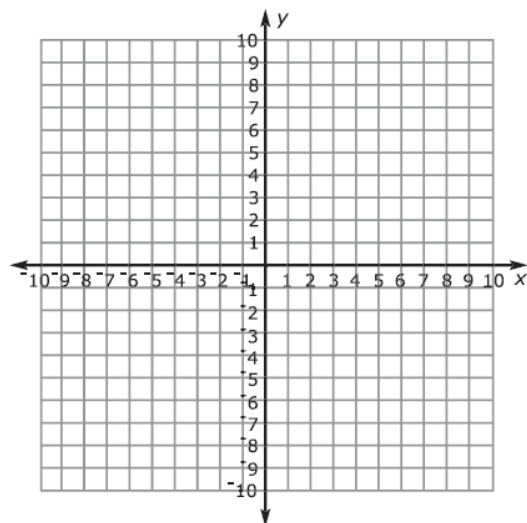
5. $y = -x^2 + 6x + 1$



Vertex:

Pattern of Change:

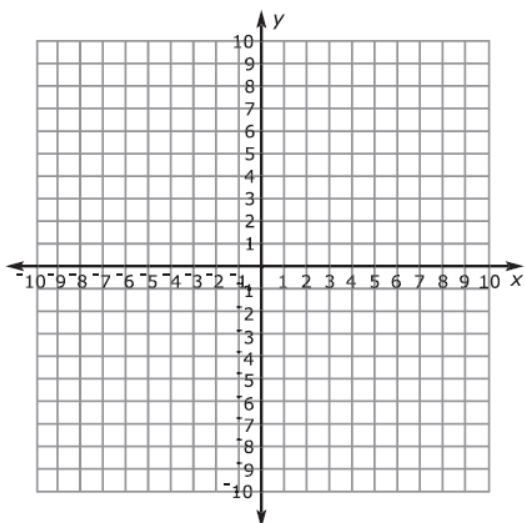
6. $y = -2x^2 - 8x - 3$



Vertex:

Pattern of Change:

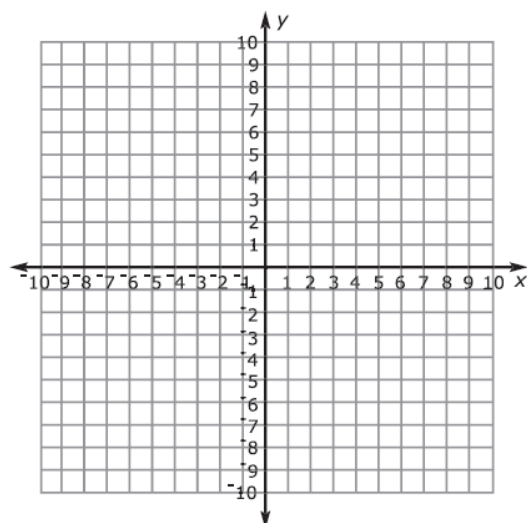
7. $y = 3x^2 + 12x + 9$



Vertex:

Pattern of Change:

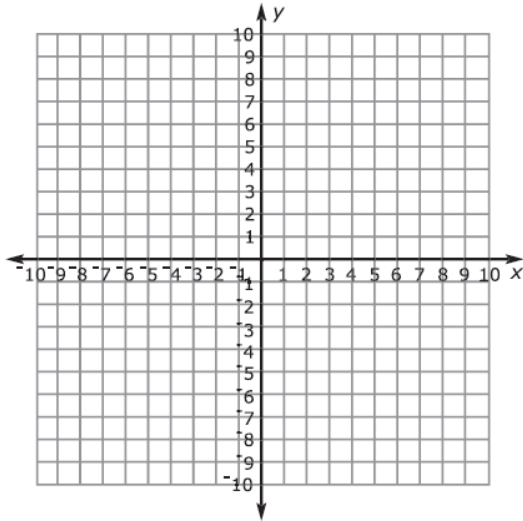
8. $y = -x^2 - 2x - 4$



Vertex:

Pattern of Change:

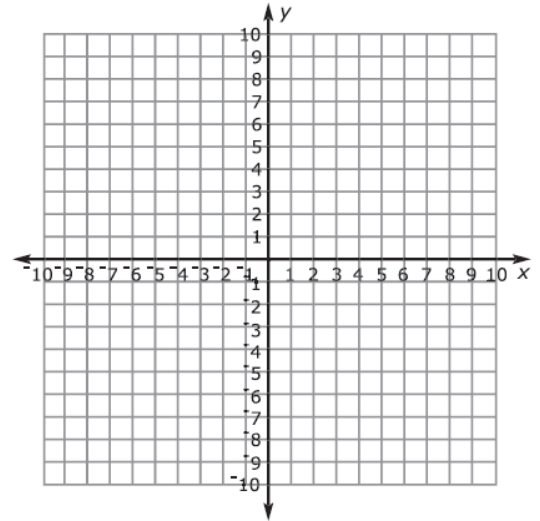
9. $y = x^2 - 6x + 4$



Vertex:

Pattern of Change:

10. $y = -2x^2 - 16x - 25$

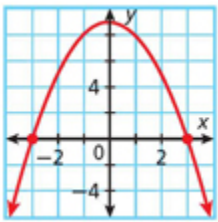


Vertex:

Pattern of Change:

Determine the value of the zeros, the equation of the axis of symmetry, the max or min value and the vertex.

11.



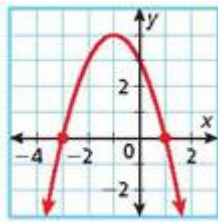
Zeros:

Axis of symmetry:

Max or Min:

Vertex:

12.



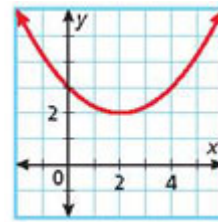
Zeros:

Axis of symmetry:

Max or Min:

Vertex:

13.



Zeros:

Axis of symmetry:

Max or Min:

Vertex:

Bonus: Graph $y = \frac{1}{2}x^2 + 2x$

Vertex:

Pattern of Change:

