Intro to Quadratic Equations

- **Quadratic Equation** – highest exponent (or degree) is 2.

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

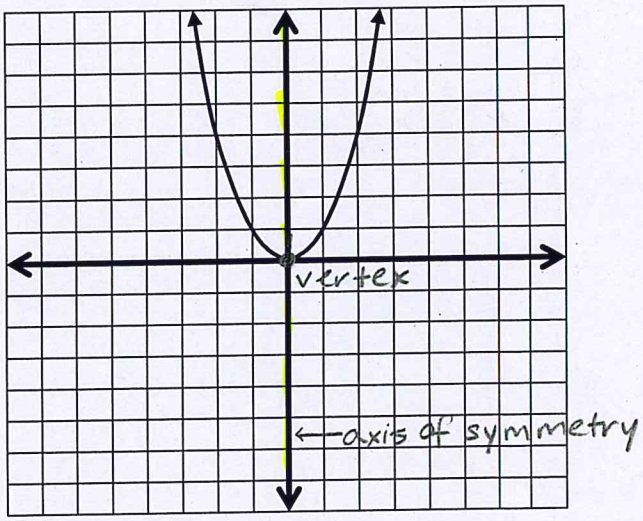
Ex: $y = x^2 - 2x - 3$ $y = 2x^2 + 9$ $y = x^2$

- **Parent Function** is $y = x^2$

↳ simplest form

- Let's set-up an x-y table and find it's graph…

X	Y
-2	4
-1	1
0	0
1	1
2	4



This graph is called a "parabola" and has 3 main features:

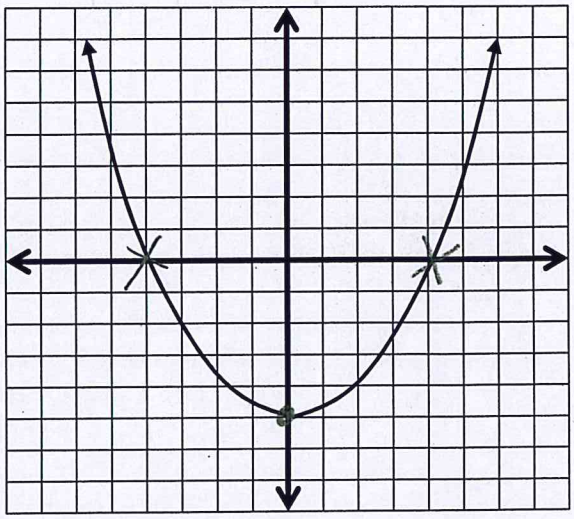
U shaped & symmetric

1. Vertex – turning point (0, 0) high point (maximum) or low point (minimum)
2. Axis of Symmetry – vertical line cutting parabola in half (x = 0) usually a dashed line depending on the curve.
3. Zeros – point(s) where graph crosses x-axis

aka x-intercepts or roots (0,0)

standard form: $y = ax^2 + bx + c$

Ex:



Vertex: (0, -5)

minimum

Axis of Symmetry: x = 0

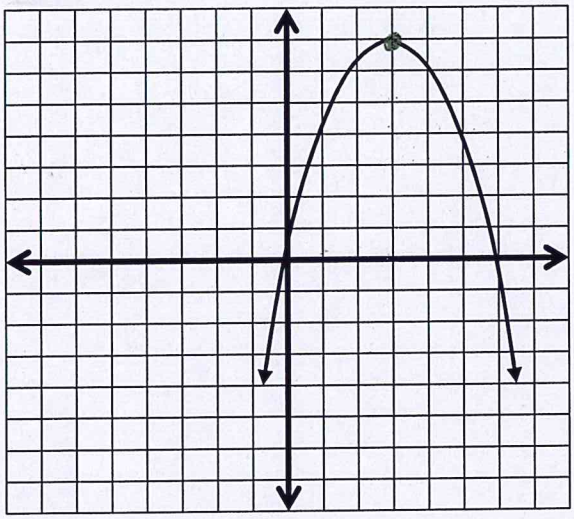
Zeros: (-4, 0) and (4, 0)

Graph opens ↑ (up), $a > 0$

Graph is wide, $a < 1$

(Think fractions)

Ex:



Vertex: (3, 7)

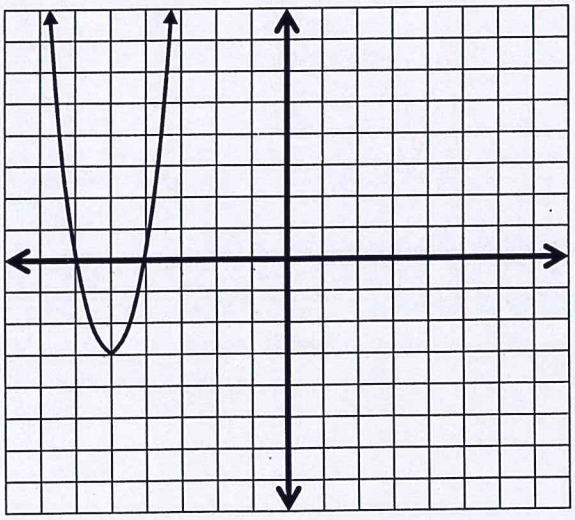
maximum

Axis of Symmetry: x = 3

Zeros: (0, 0) and (6, 0)

Graph opens ↓ (down), $a < 0$,

Ex:



Vertex: (-5, -3)

Axis of Symmetry: x = -5

Zeros: (-6, 0) and (-4, 0)

Graph is skinny, $a > 1$