

Notes: Key Elements of Quadratic Functions – Day 1

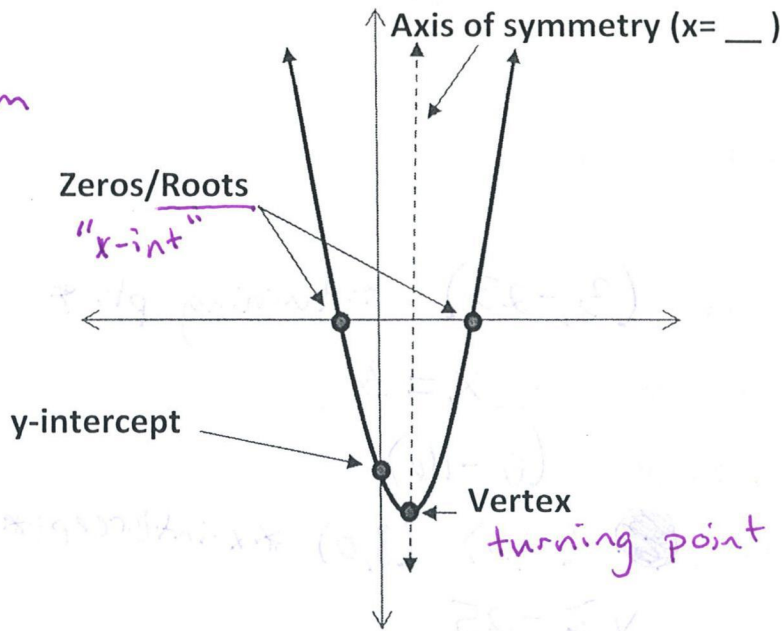
~~$y = mx + b$~~
 ~~$Ax + By = C$~~

$f(x) = Ax^2 + Bx + C$ Standard Form

$f(x) = A(x - h)^2 + k$ Vertex Form

$f(x) = A(x - r_1)(x - r_2)$ Factored Form

parabola - "U" shape curve



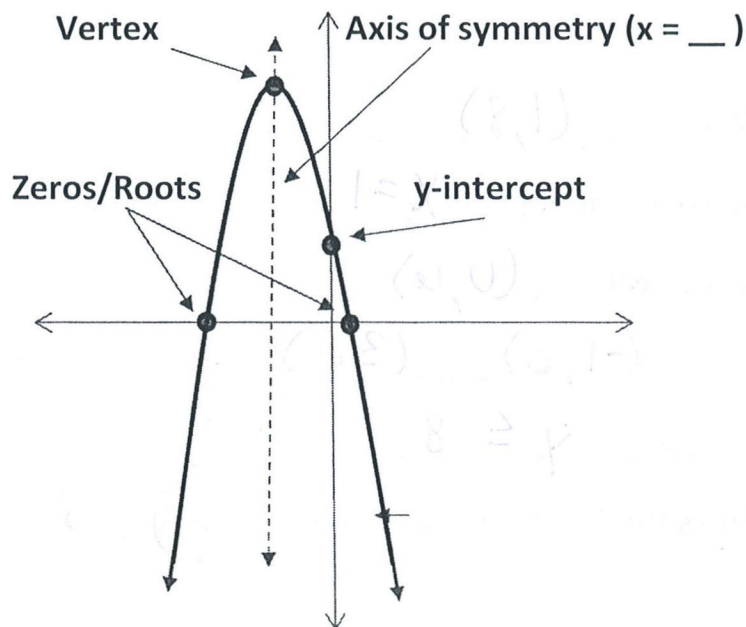
The Quadratic function has a **Minimum** when the vertex is at the bottom of the parabola!

The Range of a quadratic function with a minimum is the set of all y values: $(y \geq _)$

$f(x) = Ax^2 + Bx + C$

$f(x) = A(x - h)^2 + k$

$f(x) = A(x - r_1)(x - r_2)$



The Quadratic function has a **Maximum** when the vertex is at the top of the parabola

The Range of a quadratic function with a maximum is the set of all y values: $(y \leq _)$

Sketch and label the key elements of the quadratic functions below:

Be prepared to discuss how you know!

$$f(x) = x^2 - 6x - 16$$

Vertex (3, -25) *turning pt.* *

Axis of symmetry x = 3

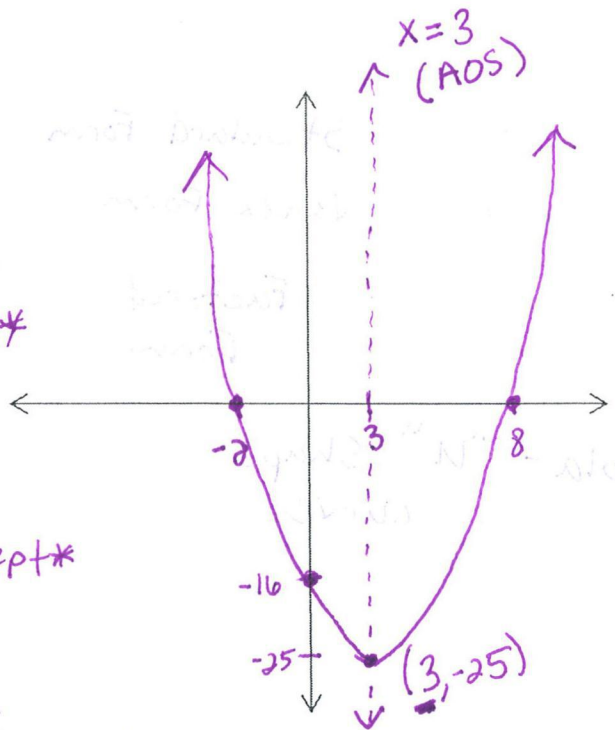
y-intercept (0, -16)

Zeros (-2, 0) (8, 0) *x-intercept*

Range y ≥ -25

Does the function have a min.? or max.? -25

Smallest y-value



$$f(x) = -2x^2 + 4x + 6$$

Vertex (1, 8)

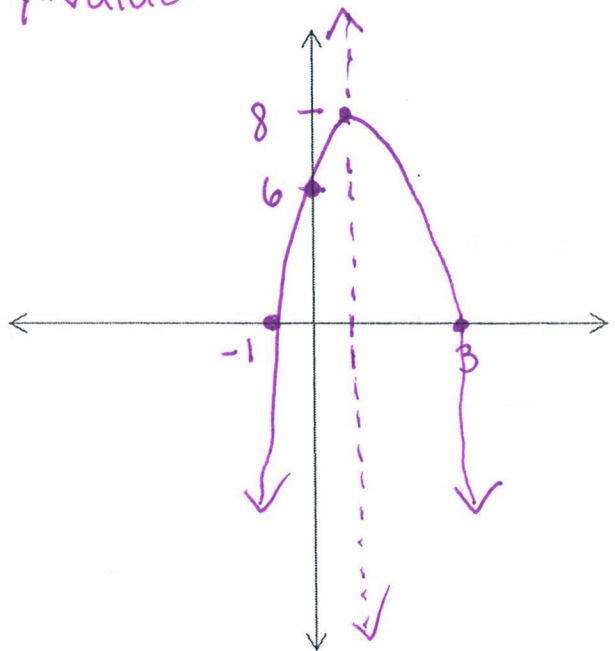
Axis of symmetry x = 1

y-intercept (0, 6)

Zeros (-1, 0) (3, 0)

Range y ≤ 8

Does the function have a min.? or max.? 8



Try these :

$$f(x) = x^2 - 4x - 21$$

$$f(x) = -x^2 + 4x - 3$$

$$f(x) = 2x^2 + 8x - 10$$