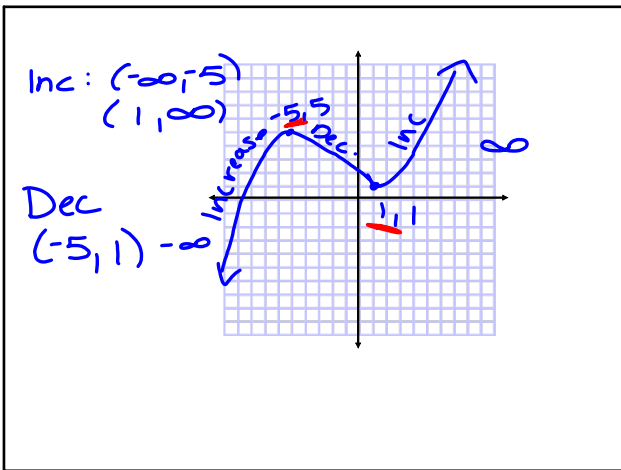


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Standard Form of a Quadratic
 $f(x) = ax^2 + bx + c$
 vertex: (h, k)
 $h = \frac{-b}{2a}$
 "a" is positive opens up
 "a" is negative opens down
 $|a| > 1$ stretches
 $|a| < 1$ shrinks

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$ax^2 + bx + c$ y-intercept $(0, c)$

Example 1: $f(x) = -x^2 + 2x + 3$
 $a = -1, b = 2, c = 3$
 $h = \frac{-b}{2a} = 1$
 $k = -(-1)^2 + 2(1) + 3 = 4$
 Vertex: $(1, 4)$
 Y-intercept: $(0, 3)$

Extra Info
 Domain: \mathbb{R}
 Range: $y \leq 4$
 Stretches or Shrinks: Neither
 Maximum or Minimum: Maximum

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Quadratic Functions in Standard Form

#1) $f(x) = x^2 - 4x - 5$
 $a = 1, b = -4, c = -5$
 Axis of Symmetry: $x = 2$
 Vertex: $(2, -9)$
 Y-intercept: $(0, -5)$
 Domain: \mathbb{R} Range: $y \leq -9$

x	y
2	-9
3	-8
4	-5

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#2) $f(x) = 3x^2 - 6x + 1$
 $a = 3, b = -6, c = 1$
 $\frac{b}{2a} = \frac{-6}{2(3)} = -1$
 $k = 3(-1)^2 - 6(-1) + 1 = 10$
 Vertex: $(1, 10)$
 Y-intercept: $(0, 1)$
 Domain: \mathbb{R} Range: $y \geq 10$

x	y
1	10
2	1
3	10

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#3) $f(x) = -2x^2 - 8x + 2$

$a = -2$ $b = -8$ $c = 2$

Axis of Symmetry: $x = -2$

Vertex: $-2, 10$

Y-intercept: $0, 2$

Domain: \mathbb{R} Range: $y \leq 10$

$\frac{-b}{2a} = \frac{8}{2(-2)} = -2$

x	y
-2	10
-1	8
0	2

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$f(x) = -x^2 + 2x - 1$

$a = -1$ $b = 2$ $c = -1$

$\frac{-b}{2a} = \frac{-2}{2(-1)} = 1$

Ext: max $(1, 0)$

AoS: $x = 1$

Inc: $(-\infty, 1)$ Dec: $(1, \infty)$

D: \mathbb{R} R: $y \leq 0$

X-int: $(1, 0)$ $(-1, 0)$

Y-int: $(0, -1)$

x	y	
1	0	$-(1)^2 + 2(1) - 1$
2	-1	$-(2)^2 + 2(2) - 1$
3	-4	$-(3)^2 + 2(3) - 1$
		$-9 + 6 - 1$
		$-3 - 1$

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