

## 5.1 Introduction to Quadratic Fncs.

Obj: 1. Define, identify & graph quadratic fncs.

\*2. Multiply linear binomials to produce a quadratic.

Quadratic:  $f(x) = \underline{ax^2 + bx + c}$  standard form

$$\begin{aligned} f(x) &= (2x-1)(3x+5) \\ &= 6x^2 + 10x - 3x - 5 \\ &= 6x^2 + 7x - 5 \end{aligned}$$

$$a=6 \quad b=7 \quad c=-5$$

$$-5 + 6x^2 + 7x$$

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$$g(x) = (2x-5)(x-2)$$

write in standard form of a quadratic & identify  $a, b, c$ .

$$\begin{aligned} g(x) &= 2x^2 - 4x - 5x + 10 \\ &= 2x^2 - 9x + 10 \end{aligned}$$

$$a=2 \quad b=-9 \quad c=10$$

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

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

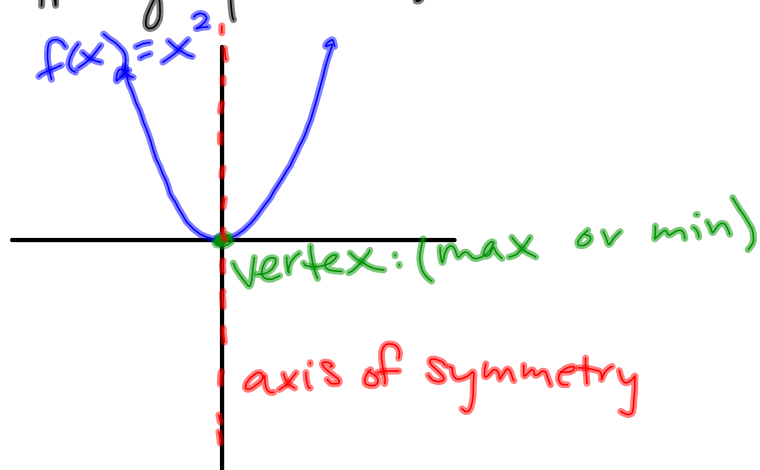
$$a=1 \quad \underline{b=0} \quad c=-1$$

$$f(x) = 2x^2$$

$$a=2 \quad b=0 \quad c=0$$

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The graph of a quadratic is a parabola.



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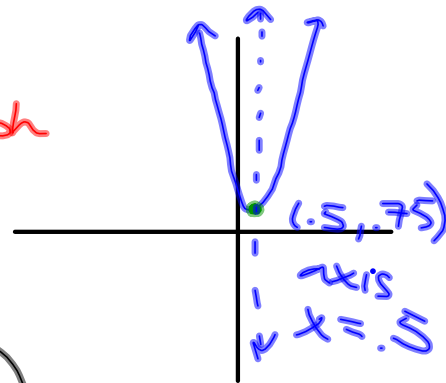
Identify whether  $f(x) = x^2 - x + 1$  has a min or max at the vertex. Find the coordinates of the vertex.

Calculator:

$y = x^2 - x + 1$  graph

vertex is a min.

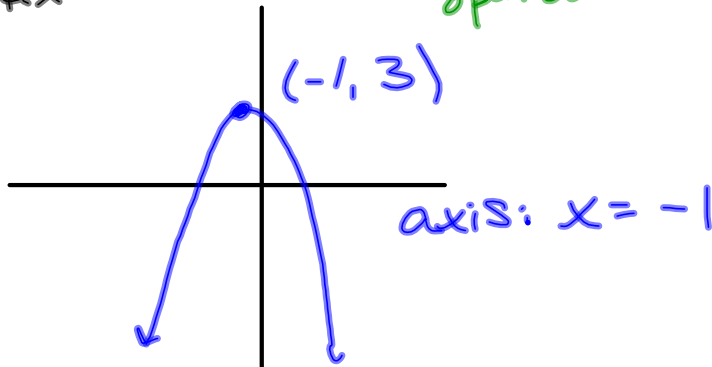
2<sup>nd</sup> Calc  $\rightarrow$  opt. 3  
min:  $(.5, .75)$



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min/max  
Find vertex  
axis

$f(x) = -2x^2 - 4x + 1$   
open down



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$$f(x) = ax^2 + bx + c$$

If  $a > 0$ , opens up, minimum

If  $a < 0$ , opens down, maximum

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State if the parabola opens up or down  
& if it has a max or min.

$$f(x) = 1x^2 + x - 6$$

opens up  
min.

$$g(x) = 5 + 4x - x^2$$

opens down  
max.

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