



## Quadratics

Vertex coordinates from standard form:

$$x_{\text{vertex}} = -\frac{b}{2a}$$

$$y_{\text{vertex}} = f(x_{\text{vertex}})$$

ex:  $f(x) = -2x^2 + 10x - 7$

negative so  
vertex is the  
maximum



$$a = -2$$

$$b = 10$$

$$c = -7$$

$$x_{\text{vertex}} = -\frac{b}{2a} = -\frac{10}{2 \cdot -2} = -\frac{10}{-4} = 2.5$$

$$y_{\text{vertex}} = f(2.5) = -2 \cdot 2.5^2 + 10 \cdot 2.5 - 7 = 5.5$$

So the vertex has coordinates (2.5, 5.5)

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Vertex coordinates from factor form:

$x_{\text{vertex}}$  = "average" of the  $x$ -intercepts

$$y_{\text{vertex}} = f(x_{\text{vertex}})$$

ex:  $f(x) = 0.1(x+4)(x-2)$

positive so  
vertex is the  
minimum



$x$ -intercepts are -4 and 2

$$x_{\text{vertex}} = \frac{-4+2}{2} = \frac{-2}{2} = -1$$

$$y_{\text{vertex}} = f(-1) = -0.9$$

Vertex (-1, -0.9)