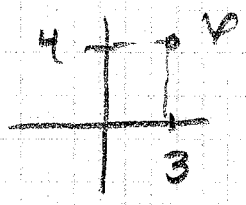
Quadratic Functions. Part III

$y = 2(x-3)^2 + 4$ Vertex Form

$h = 3 \quad k = 4$



$y = x^2 - 2x - 3$ Standard Form

completing the squares

$y = ax^2 + bx + c$

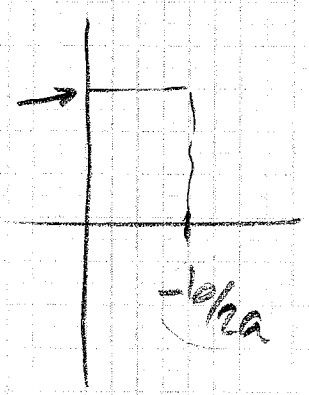
$y = a\left(x^2 + \frac{b}{a}x + \cdots\right) + c \cdots$

half $\frac{b}{2a}$

$\frac{\frac{b}{a}}{2} = \frac{b}{a} \cdot \frac{1}{2}$

$y = a\left(x + \frac{b}{2a}\right)^2 + \cdots$

$\boxed{h = -\frac{b}{2a}} \qquad k = f\left(-\frac{b}{2a}\right)$



EX: $y = -3x^2 + 3x - 3$

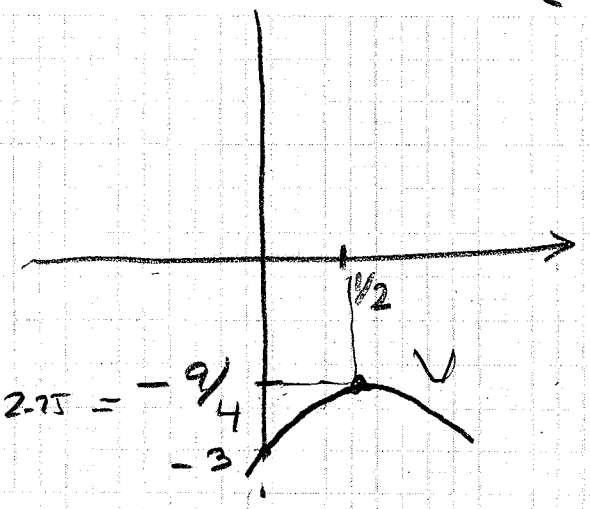
$h = -\frac{3}{2(-3)} = \frac{1}{2}$

$k = f(1/2)$

$= -3(1/2)^2 + 3(1/2) - 3$

$= -9/4 = -2.25$

$a = -3 < 0$ ∩



y-int

$x = 0 \Rightarrow y = -3x^2 + 3x - 3$

$y = -3$

x-int

$y = 0 \Rightarrow y = -3x^2 + 3x - 3$

$-3x^2 + 3x - 3 = 0$

$x^2 - x + 1 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{1 \pm \sqrt{1 - 4 \cdot 1 \cdot 1}}{2 \cdot 1}$$

$$= \frac{1 \pm \sqrt{-3}}{2}$$

no real solution

NO x-intercepts