Quadratic form

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

$$y = ax^2 + bx + c$$

Parabolic form:

$$y - k = a(x - h)^2$$

$f(x) = 3x^2 + 6x - 1$

I need to complete the square.

$\frac{y}{3} = \frac{3x^2 + 6x - 1}{3}$

$\frac{y}{3} = x^2 + 2x - \frac{1}{3}$

$+\frac{1}{3}$

$\frac{y}{3} + \frac{1}{3} + 1 = x^2 + 2x + 1$

$(a+b)(a+b)$

$a^2 + ab + ab + b^2 = a^2 + 2ab + b^2$

$a = x \qquad 2x = 2ab$

$2x = 2x \cdot b$

$\frac{2}{2} = \frac{2b}{2}$

$b = 1$

$\frac{y}{3} + \frac{1}{3} + 1 = x^2 + 2x + 1$

$3\left(\frac{y}{3} + \frac{4}{3}\right) = \left((x+1)^2\right)3$

$y + 4 = 3(x+1)^2$

Graphing from Quadratic form.

$f(x) = -\frac{1}{2}x^2 + 3x - 5$

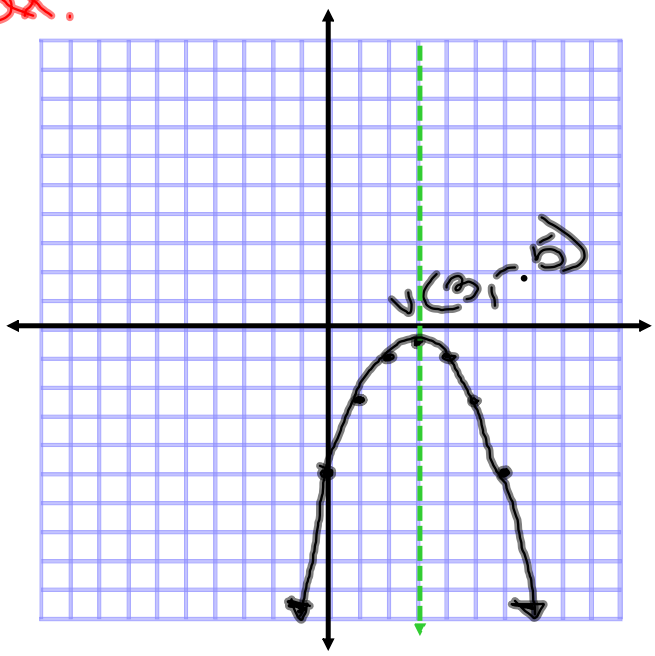
→ plug into calculator & graph

→ use calc menu to find vertex

2nd Trace

min. or max.

$V: (3, -.5)$



$y = 2x^2 + x - 4$

$x = -.2499995 = -0.25$

$y = -4.125 = -4.13$

$V(-0.25, -4.13)$

other points from table

$(2, 6)$, $(1, -1)$, $(0, -4)$

To find symmetric points, we can fold our paper vertically through our vertex, then hold the paper up to the light to see the point we already drew and draw them on the other half of the paper. Unfolding shows us the parabola!