Algebra 1B Handwritten Quiz

$y = x^2 - 4x - 45$

Completing the Square

$x^2 - 4x - 45 = 0$

$+45 \quad +45$

add to both sides

$x^2 - 4x + 4 = 45 + 4$

$\left(\frac{-b}{2}\right)^2$

$\left(\frac{-4}{2}\right)^2 = 4$

$x^2 - 4x + 4 = 49$

$\sqrt{(x-2)^2} = \pm\sqrt{49}$

$x - 2 = \pm 7$

$+2 \quad +2$

$x = 2 \pm 7$

$x = 9, -5$

roots

(9,0) (-5,0)

Factoring

$x^2 - 4x - 45 = 0$

$x - 9 = 0 \quad x + 5 = 0$

$+9 \quad +9 \quad -5 \quad -5$

$x = 9 \quad x = -5$

(9,0) (-5,0) roots

Quadratic Formula

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

$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-45)}}{2(1)}$

$x = \frac{4 \pm \sqrt{4^2 - 4(-45)}}{2}$

$x = \frac{4 \pm \sqrt{16 + 180}}{2}$

$x = \frac{4 \pm \sqrt{196}}{2}$

$x = \frac{4 \pm 14}{2}$

$x = 2 \pm 7$

$x = 9, -5$

(9,0) roots (-5,0)

Vertex

$x = \frac{-b}{2a} \quad x = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2 = x$

axis of symmetry

$y = x^2 - 4x - 45$

$y = 2^2 - 4(2) - 45$

$y = 4 - 8 - 45$

$y = -4 - 45$

$y = -49$

(2, -49) vertex

Graph