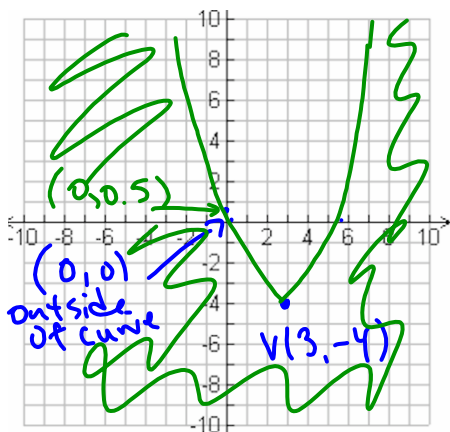


Inequalities and Quadratic Functions

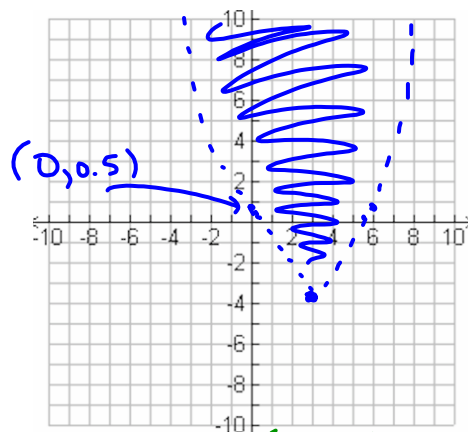
When finding the region associated with a given quadratic inequality, test a point to determine which region to shade.

Graph the following:

$$y \leq 0.5(x-3)^2 - 4$$



$$y > 0.5(x-3)^2 - 4$$



① Find the zeros:

$$\text{Check: } -\frac{k}{a} = \frac{-(-4)}{0.5} = 8$$

$$x_1 = 3 - \sqrt{8} = 0.172 \quad x_2 = 3 + \sqrt{8} = 5.83$$

② y-int: $x=0, y=?$

$$y = 0.5(0-3)^2 - 4 = 0.5$$

$$(0, 0.5)$$

Test, (0, 0)

$$0 > 0.5(x-3)^2 - 4$$

$$0 > 0.5 \quad \underline{\text{NO}}$$

OR Test (3, 0)

$$0 > 0.5(3-3)^2 - 4$$

$$0 > -4 \quad \checkmark$$

③ Test (0, 0)

$$0 \stackrel{?}{\leq} 0.5(0-3)^2 - 4$$

$$0 \leq 0.5 \quad \checkmark$$

Graph the following inequalities:

1) $y < x^2 - 4$

2) $y \geq -2(x-4)^2 + 1$

3) $y > x^2 - 6x + 8$

4) $y \leq 0.5(x+1)(x-2)$

