**Adv. Alg. With Trig**, Glawe **Name:** ________________________________ **Date:** __________ **Pd:**______

**Graphing Quadratic Inequalities**

A **quadratic inequality in two variables** can be written in one of the following forms:

$y < ax^2 + bx + c$ $\quad$ $y \leq ax^2 + bx + c$ $\quad$ $y > ax^2 + bx + c$ $\quad$ $y \geq ax^2 + bx + c$

To graph a quadratic inequality in one of the forms above, follow these steps:

Step 1: **Graph** the parabola $y = ax^2 + bx + c$. Make the parabola *dashed* for inequalities with < or > (not equal to) and *solid* for inequalities with ≤ or ≥ (equal to).

Step 2: **Test** a point ($x$, $y$) to determine whether the point is a solution of the inequality. Remember the point you test cannot be on the parabola itself.

Step 3: **Shade** the region using the point you tested in Step 2. If the point produces a true statement, then you shade where the point is. If the point produces a false statement, then you shade where the point is not.

**Example**: Graph $y > x^2 + 3x - 4$.

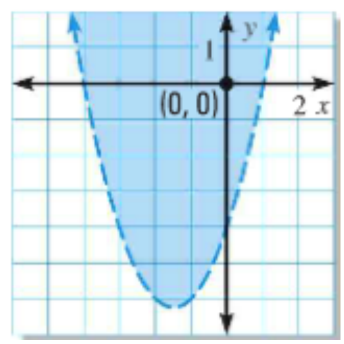
Step 1: **Graph** $y = x^2 + 3x - 4$. Since the inequality symbol is >, make the parabola dashed.

Step 2: **Test** a point, such as (0, 0).

$y > x^2 + 3x - 4$ $\qquad$ $0 > (0)^2 + 3(0) - 4$ $\qquad$ $0 > -4$ ✓

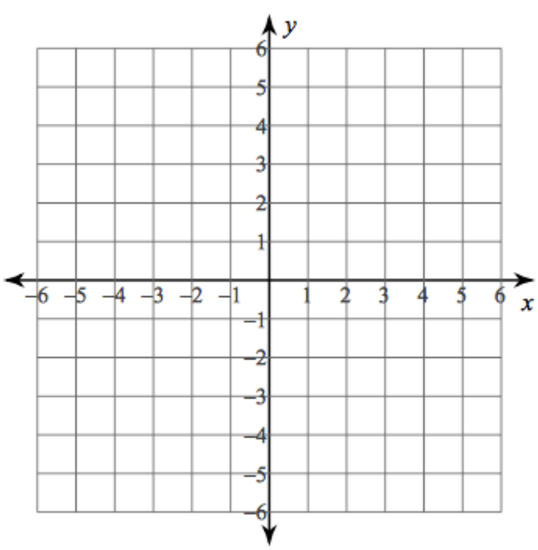
So, (0,0) is a solution of the inequality.

Step 3: **Shade** the region of the parabola where (0, 0) is (inside the parabola).

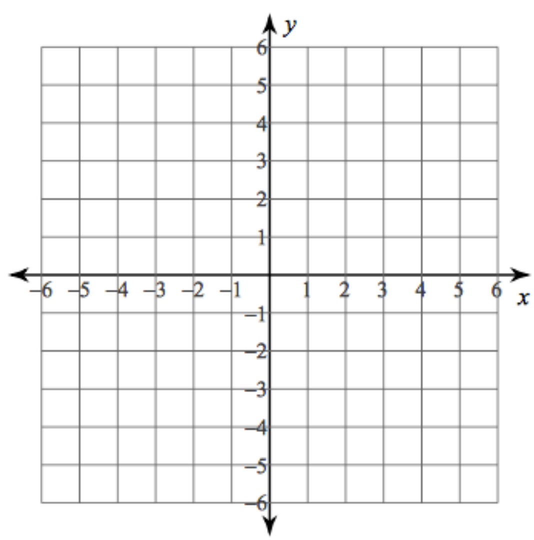



Graph the following quadratic inequalities on a coordinate plane.

1) $y \geq x^2 + 2x - 3$



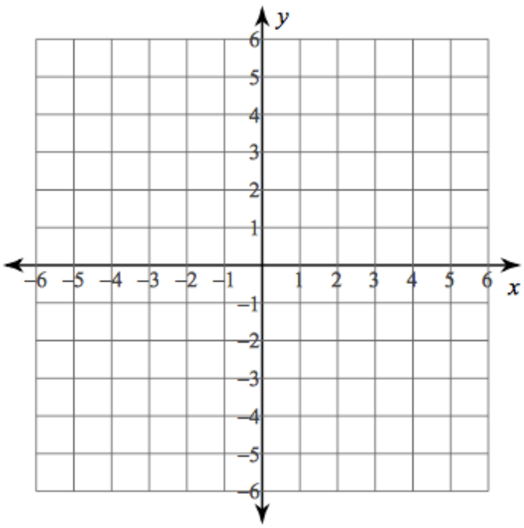
2) $y < -x^2 + 4x - 3$



Graph the following system of quadratic inequalities on a coordinate plane. Remember, it is helpful just to use arrows at first and then shade your final solution. You may need to change the units of your axes.

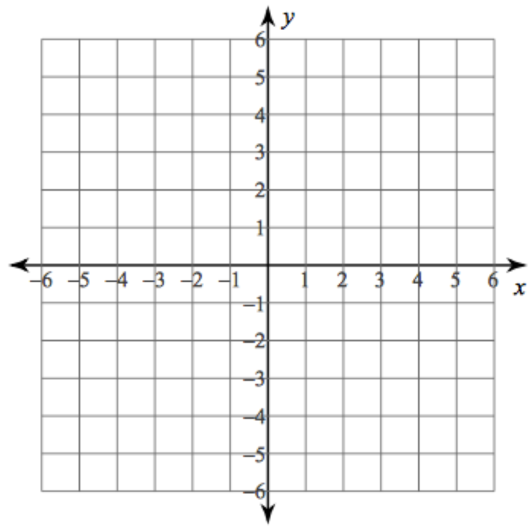
3) $y \le -x^2 + 4$

$y > x^2 - 2x - 3$



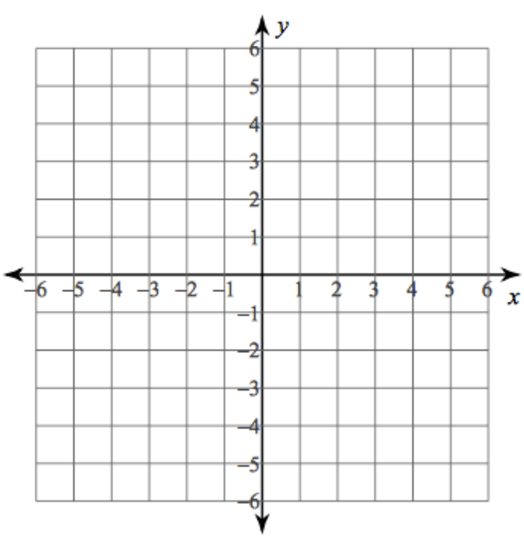

4) $y \ge 2x^2$

$y < -x^2 + 1$




5) $y \le -x^2 + 4x - 4$

$y < 2x^2 + x - 8$




6) $y \ge x^2 - x - 6$

$y < -2x^2 - 4x + 3$

$y \ge x$