3.6 Quadratic Inequalities

Do Now: Graph the following inequalities.

1) $y \geq -3$

2) $y < 5$

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

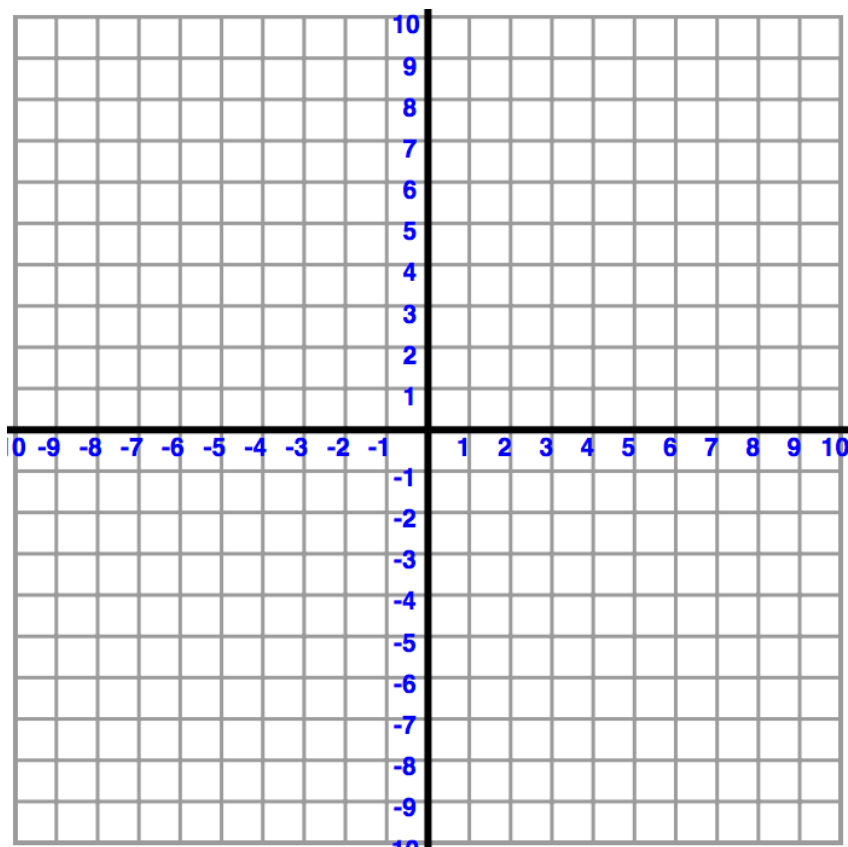$$y < ax^2 + bx + c \qquad\qquad y > ax^2 + bx + c$$

$$y \leq ax^2 + bx + c \qquad\qquad y \geq ax^2 + bx + c$$

Example 1: Graphing a quadratic inequality in two variables:
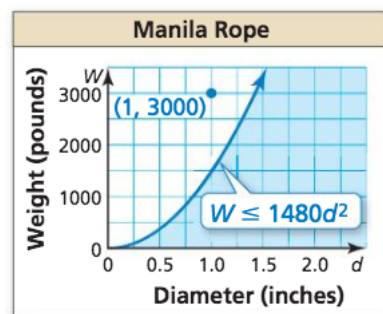
Graph $y < -x^2 - 2x - 1$

Example 2: Using Quadratic inequality in Real Life

A manila rope used for rappelling down a cliff can safely support a
weight W (in pounds) provided

$$W \leq 1480d^2$$

where d is the diameter (in inches) of the rope. Graph the inequality and
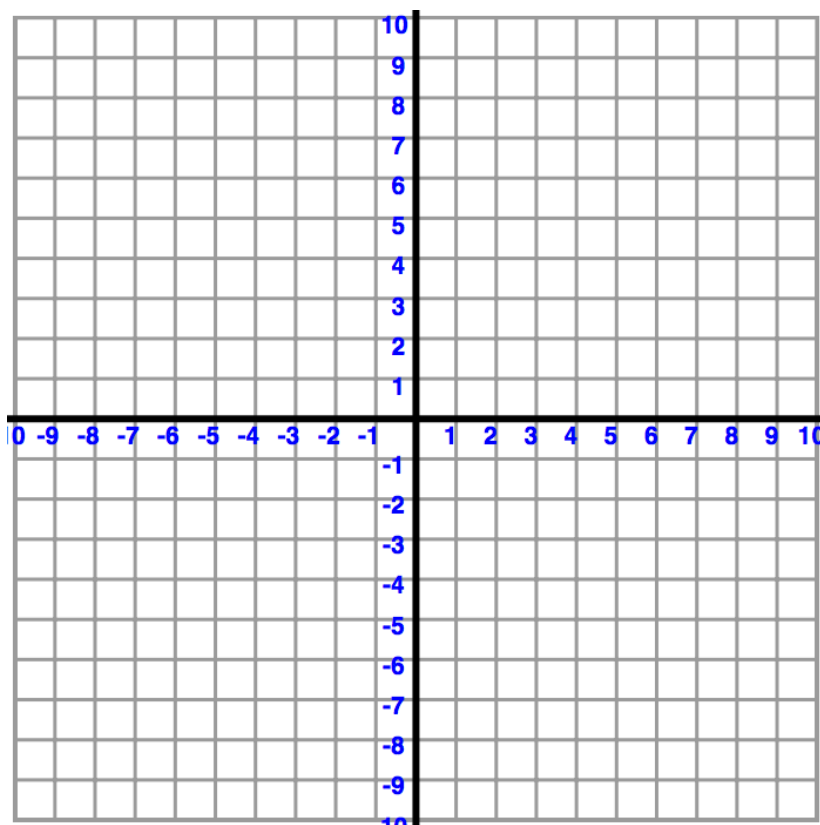interpret the solution.

Example 3: Graphing a system of quadratic Inequalities

Graph the system of quadratic inequalities.

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

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

Example 4: Solving a quadratic Inequality algebraically

Solve and graph $x^2 - 3x - 4 < 0$ (round to the tenths place)

Example 5: Solving a quadratic by graphing

Solve $3x^2 - x - 5 \geq 0$

Example 6: Modeling using mathematics

A rectangular parking lot must have a perimeter of 440 feet and an area of at least 8000 square feet. Describe the possible lengths of the parking lot. (Round to the nearest foot)

Classwork / Homework:
3-6, 12, 15, 17, 18, 23, 27, 29, 44