Recall: To graph a linear inequality:

- Graph the boundary equation.
  - If the inequality is “<” or “>”, use a dashed line (the points on the line do not satisfy the inequality).
  - If the inequality is “≥” or “≤”, use a solid line (the points on the line satisfy the inequality).

- Choose a test point not on the line and substitute it into the original inequality.
  - If you get a true statement, shade the ½ plane containing the point (all the points in that ½ plane satisfy the inequality).
  - If you get a false statement, shade the opposite ½ plane.

For example, graph \( y < -x + 1 \).

Nonlinear Inequalities

Graphing nonlinear inequalities is the same process as above, we just have to choose a test point from each region that the graph divides the plane into (so there may be more than just 2 regions), and the boundary lines may be “curves” instead!

Example 1: Graph \( y < -x^2 \).
**Systems of Inequalities**

More than one inequality can be included to form a system of inequalities. The solution to the system is the set of all ordered pairs that satisfy all the inequalities involved in the system.

We can graph a system of nonlinear inequalities to illustrate the solution set. To do this, we graph each inequality and find where their solution sets overlap (the intersection of the graphs). These are the ordered pairs that satisfy the system.

*Example 2:* Graph the solution to the system.

\[
\begin{align*}
    x + y & \geq 4 \\
    y & \geq x^2 + 1
\end{align*}
\]

*Example 3:* Graph the solution to the system.

\[
\begin{align*}
    x & \geq 0 \\
    y & \geq 0 \\
    x + y & \geq 4 \\
    2x + 3y & \geq 6
\end{align*}
\]