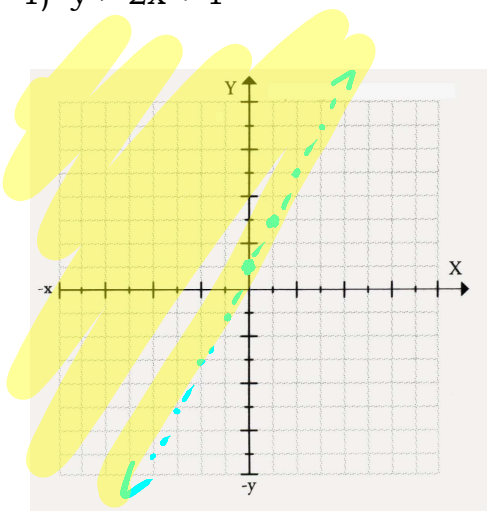
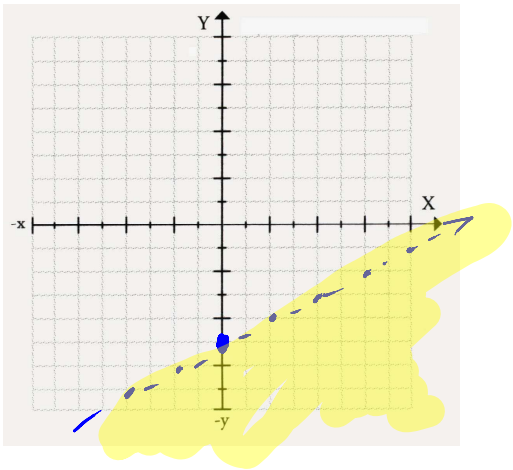
Algebra Part 3 **Name**_____
Unit 7 **Date**_____

Warm-up Graph the following inequalities.

1) $y > 2x + 1$



2.) $y < \frac{1}{2}x - 5$



Guided Notes
Unit 7 – Solve Systems of Linear Inequalities

A solution to a system of linear inequalities is an ordered pair that is a solution of **each** inequality in the system.

The graph of a system of linear inequalities is the graph of ALL solutions of the system.

Key Concept: **Graphing a System of Linear Inequalities**

Step 1: **Graph** each inequality, including shading all possible solutions
*** Remember dotted or solid lines ***

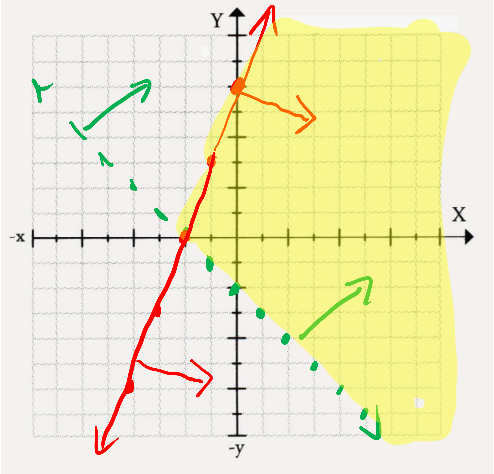
Step 2: **Find** the intersection of the half-planes (shaded areas). The graph of the systems is this intersection.

Example 1: **Graph the system of inequalities.** **$y > -x - 2$**
$y \leq 3x + 6$

Step 1: **Graph** each inequality on the same coordinate plane below.

Step 2: **Find** the intersection of their shading. This is the solution to the system of inequalities.

$y > -x - 2$ ① dotted, shade up
$y \leq 3x + 6$ ② solid, down



Example 2: Solve the system of inequalities by graphing.

① $y \geq -1$ - horizontal
② $x + 2y \leq 4$

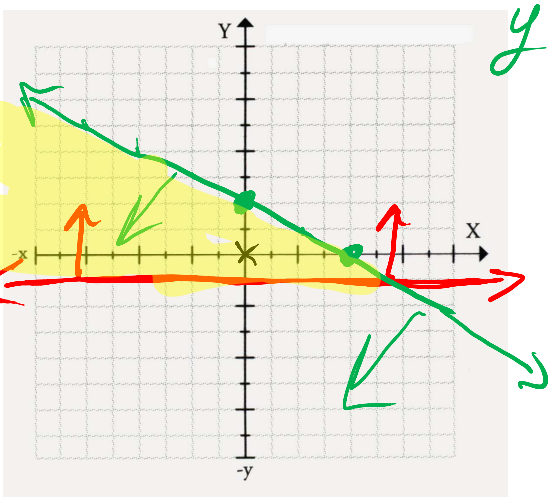
$2y \leq -x + 4$

$y \leq -\frac{1}{2}x + 2$

Step 1: **First, re-write the second inequality.**

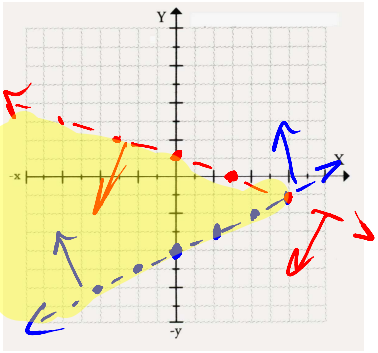
Step 2: **Graph** the inequalities.

Step 3: **Find** the intersection of the shading.



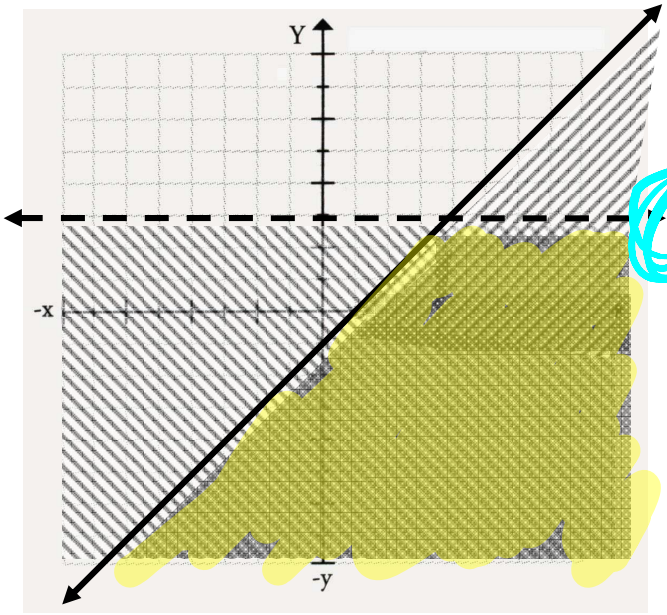
$0 \leq 4$

Example 3: $y > \frac{1}{2}x - 4$ ①
$2x + 6y < 6$ ②



Example 3: **Write a system of linear inequalities.**

Write a system of inequalities for the graph below.

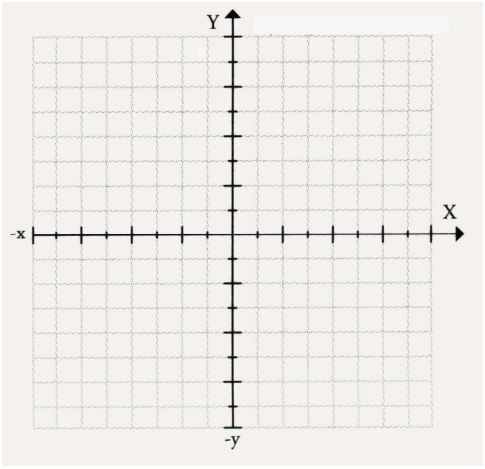


① $y \leq x - 1$

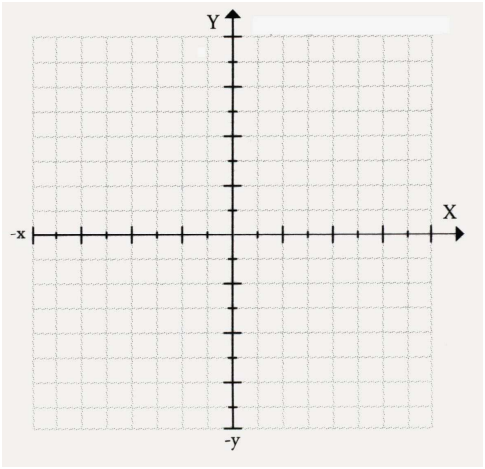
② $y < 3$

Guided Practice. Graph the following inequalities.

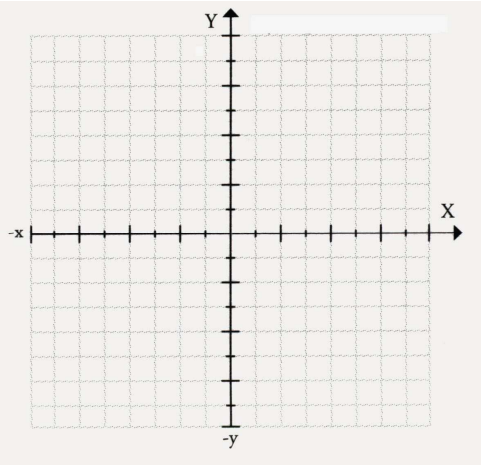
1.) $y < x - 4$
$y \geq -x + 3$



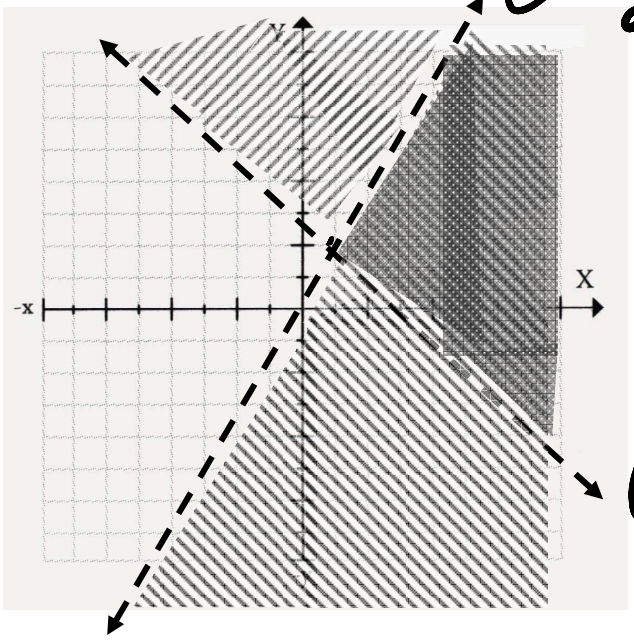
2. $y \geq -x + 2$
$x < 3$



3.) $y < 3x$
$y \geq -2x + 1$



4.) **Write a system of inequalities for the shaded region.**



① $y < 2x$

② $y > -\frac{2}{3}x + 3$