solid line

Example 2: Graph $2x - 5y \geq 10$.

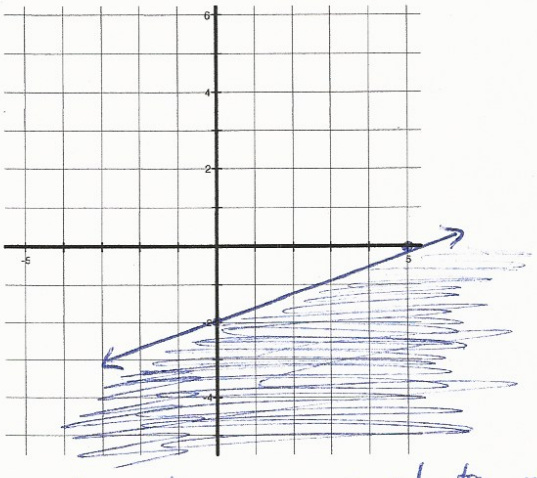
① $2x - 5y \geq 10$

$-2x \quad -2x$

$-5y \geq -2x + 10$

$\frac{-5y}{-5} \leq \frac{-2x}{-5} + \frac{10}{-5}$

$y \leq \frac{2}{5}x - 2$



Shade below

② Sub (0,0)

$0 \leq \frac{2}{5}(0) - 2$

$0 \leq -2$

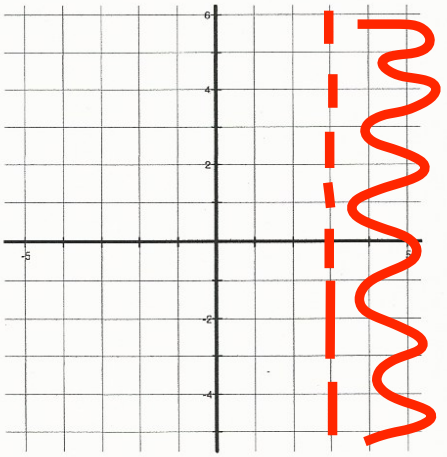
Is zero less than or equal to negative 2?

No! so that point is not in solution region.

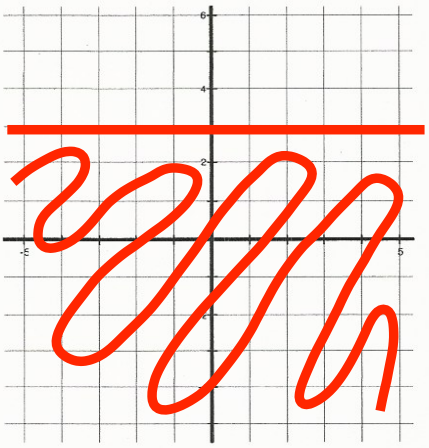
you try!

Example 3: Graph the solution set for each linear inequality on a Cartesian plane:

a. $x - 3 > 0$



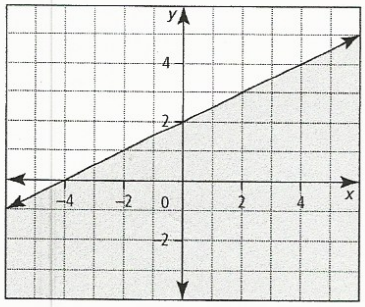
b. $-3y + 9 \geq -3 + y$



Example 4: Write an inequality to represent the graph:

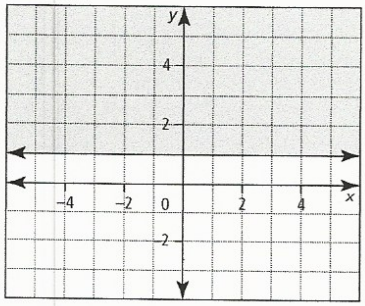
a.

You try ↳



Y is less than or equal to 1/2x + 2

b.



Boundary line:

Slope = 0 (no slope)

y-int = 1

$y = 0x + 1$

$\boxed{y = 1}$ ↰

linear equality

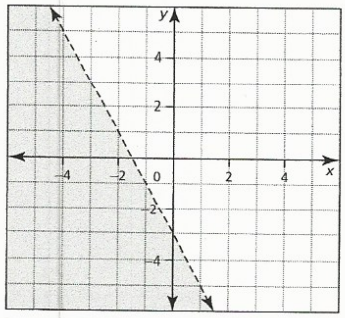
Solid line and shade above the boundary line

↓

linear inequality ↳ $\boxed{y \geq 1}$

c.

You try ↳



y < -2x -3

FOM 11 **6.3 Graphing to Solve Systems of Linear Inequalities**

In Grade 10 you studied systems of linear equations in two variables. The solution is the point(s) of intersection of the lines.

Grade 10

Eg. Solve the linear system by graphing:

$2x - y = -1$

$x + y = -2$

$2x - y = -1$

$-2x \quad -2x$

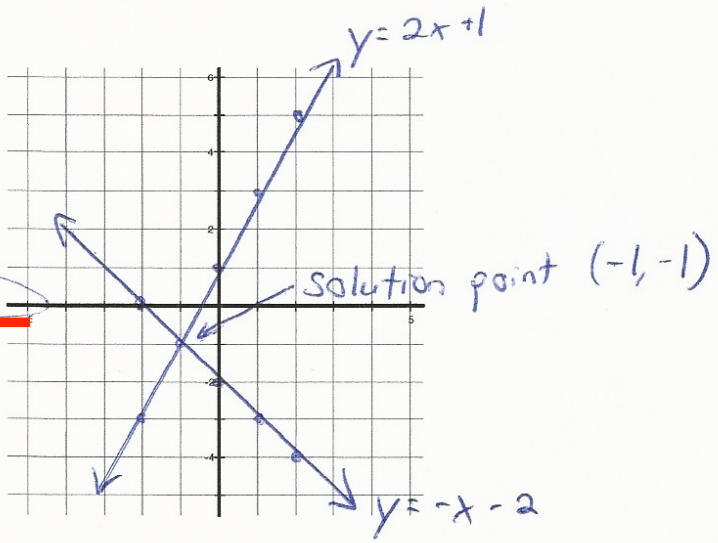
$\frac{-y}{-1} = \frac{-2x}{-1} - \frac{1}{-1}$

$y = 2x + 1$

$x + y = -2$

$-x \quad -x$

$y = -x - 2$



Grade 11

Here, we look at systems of linear **inequalities**. The solution is the region where the corresponding half-planes intersect or overlap.

Eg. Graph the region defined by these inequalities:

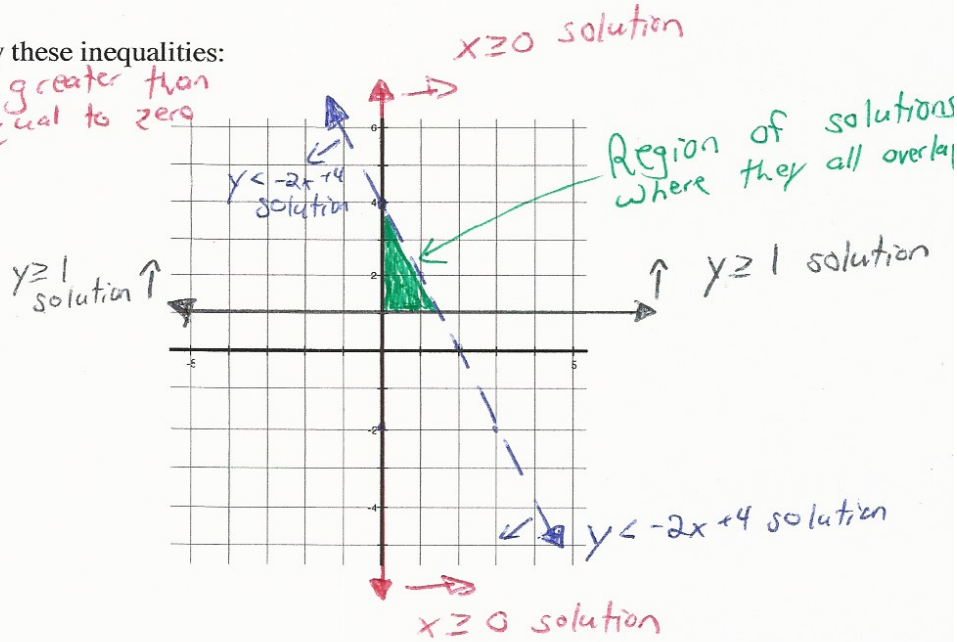
$x \geq 0$ → x is greater than or equal to zero

$y \geq 1$ ← y is greater than or equal to 1

$2x + y < 4$

$y < -2x + 4$

y is less than $-2x + 4$



Example 1: A sporting goods manufacturer makes footballs and soccer balls. Each football takes 3 min on a cutting machine and 1 min on a stitching machine. A soccer ball takes 3 min on a cutting machine and 4 min on a stitching machine. What combinations of balls can be made in 1 hour or less? → various combos: 15 footballs an 5 soccer balls (5, 15) is one example

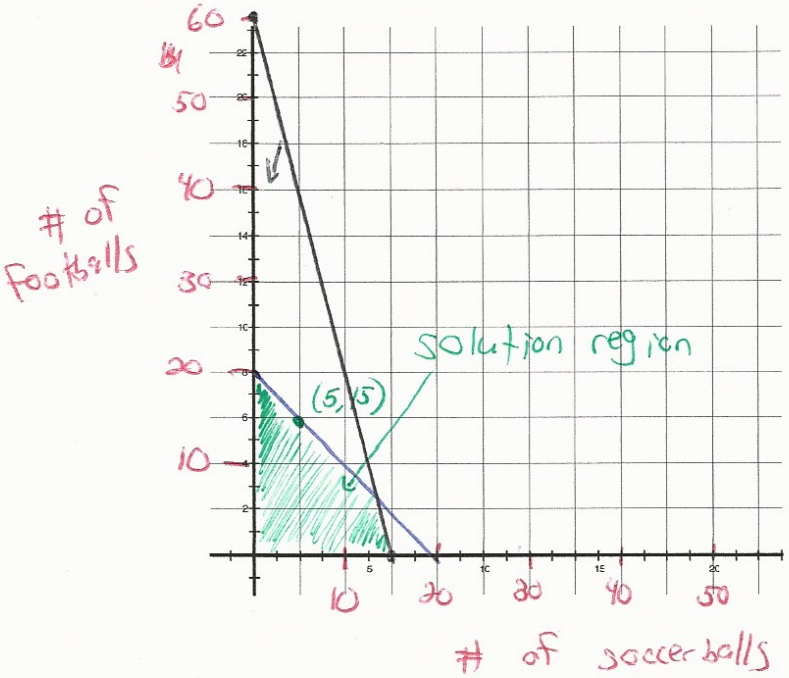
let x = # of soccerballs
let y = # of footballs

Cutting minutes:

$3x + 3y \leq 60$
$-3x \quad -3x$
$\frac{3y}{3} \leq \frac{-3x}{3} + \frac{60}{3}$
$y \leq -x + 20$

Stitching minutes:

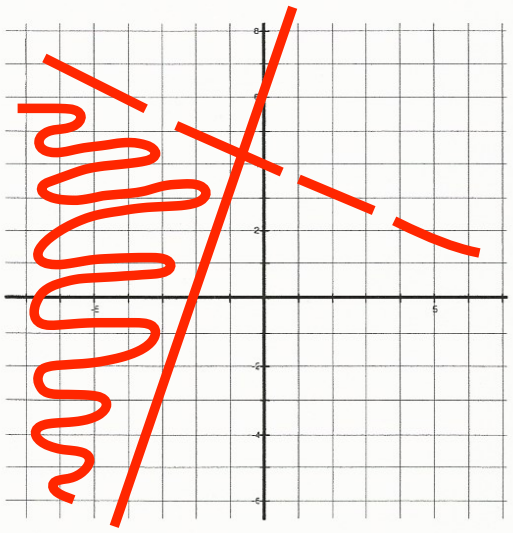
$4x + y \leq 60$
$-4x \quad -4x$
$y \leq -4x + 60$



you try →

Example 2: Graph the solution set for the following system of inequalities. Choose two possible solutions from the set.

$x + 2y < 8$
$3x - y \leq -6$



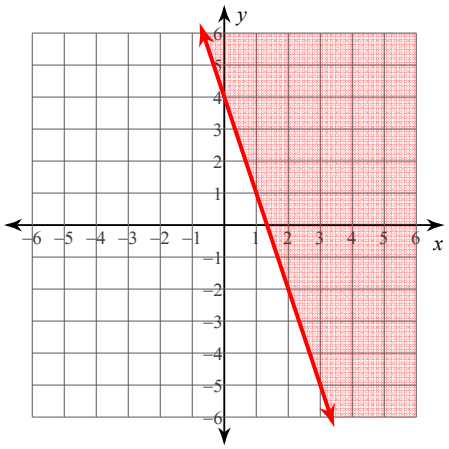
Name_____

Graphing Linear Inequalities

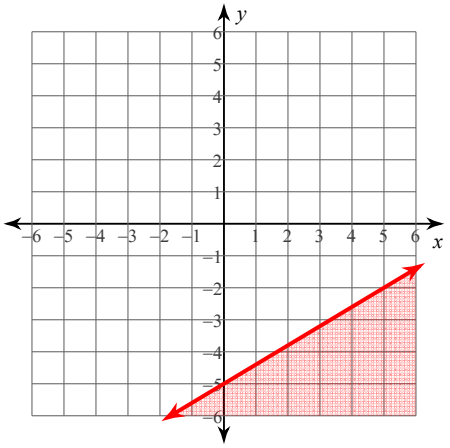
Date_____ Period____

Sketch the graph of each linear inequality.

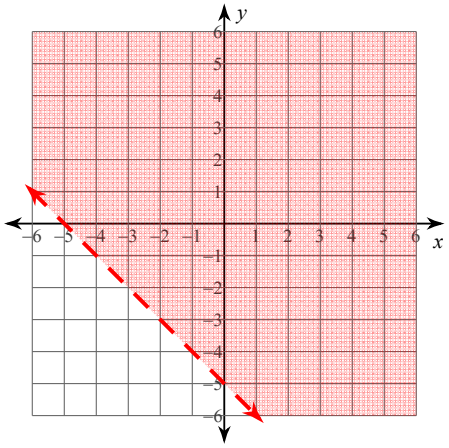
1) $y \geq -3x + 4$



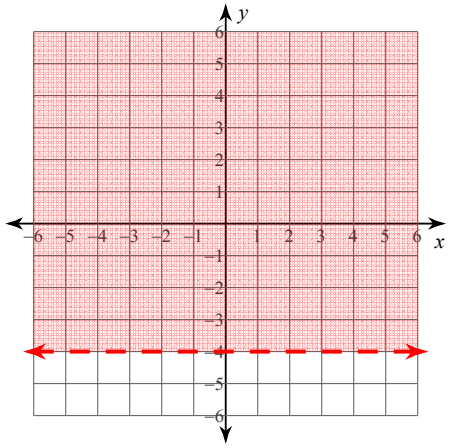
2) $y \leq \frac{3}{5}x - 5$



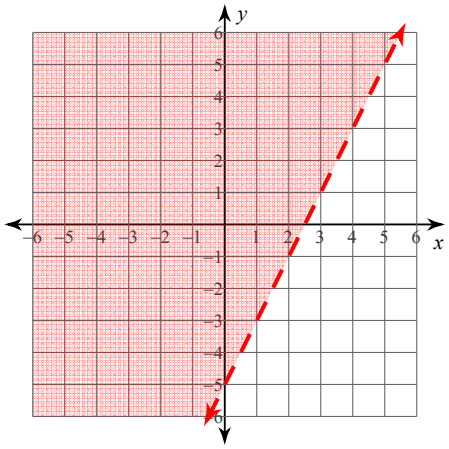
3) $y > -x - 5$



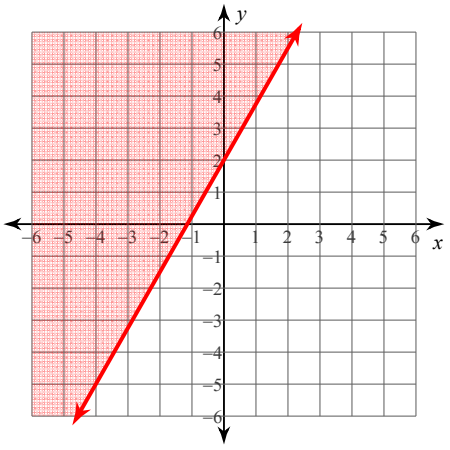
4) $y > -4$



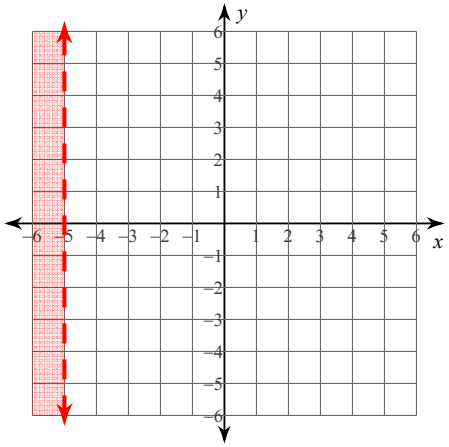
5) $y > 2x - 5$



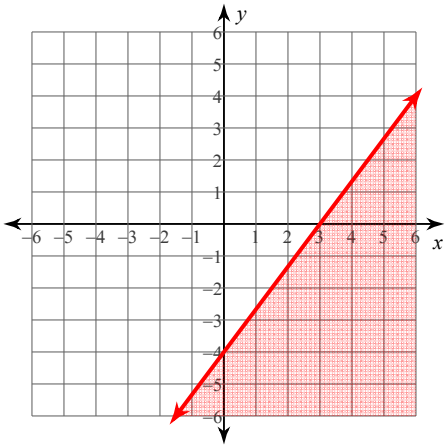
6) $y \geq \frac{7}{4}x + 2$



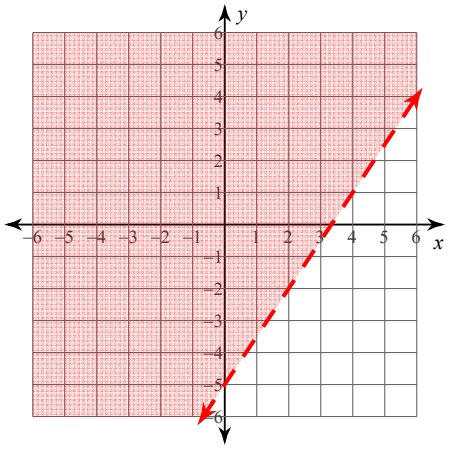
7) $x < -5$



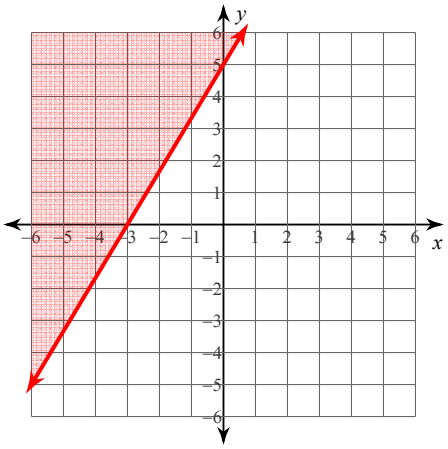
8) $y \leq \frac{4}{3}x - 4$



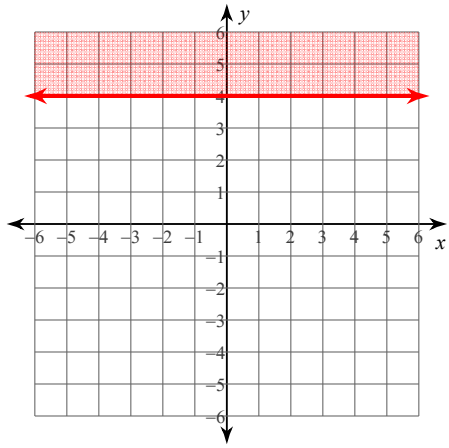
9) $3x - 2y < 10$



10) $5x - 3y \leq -15$



11) $y \geq 4$



12) $x - y > 2$