Lesson 3-3: Systems of Inequalities I can solve a System of Linear Inequalities by Graphing.

EQ: How do you solve a system of inequalities by graphing?

EX.1 - Solving a System by Graphing

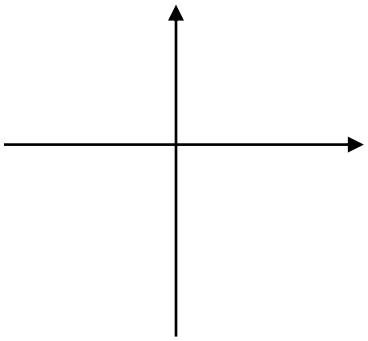
Graph the system of Linear Inequalities.

1.

$$y > -2$$
$$y \leq 1$$

x	y

x	y



Steps for graphing a system of Linear Inequalities

1. Graph both corresponding lines. Determine which way to shade by checking a point away from each line. (plug it into the inequality)

- If you get a yes, shade that direction
- If you get a no, shade the other direction

2. Then shade (darken) the region that contains the common points

3. Check a point inside the shaded region to confirm your answer

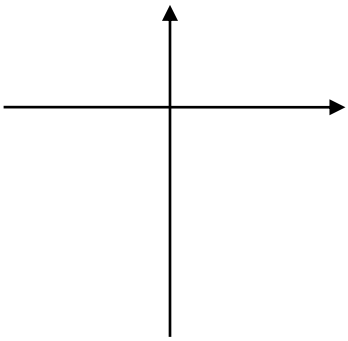
2.

$$y > 2x - 7$$
$$4x + 4y < -12$$

x	y

x	y

Check (,)



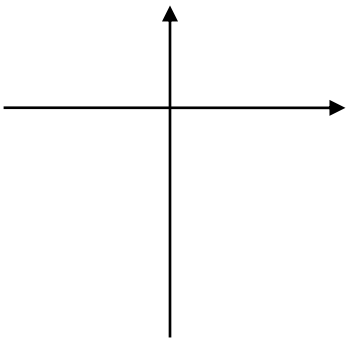
3.

$$y \geq -3x + 2$$
$$5x - 2y \leq -10$$

x	y

x	y

Check (,)



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EQ: How do you solve a system of inequalities by graphing?

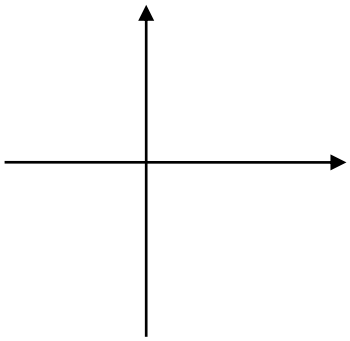
4.

$y < 4$

$y \geq |x - 3|$

x	y

x	y



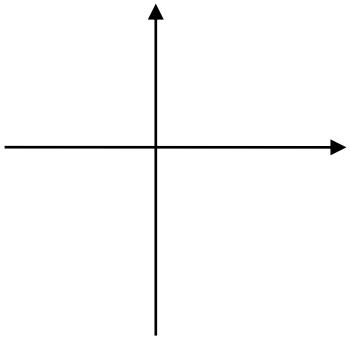
5.

$y \geq x$

$y \leq |x + 5| - 2$

x	y

x	y



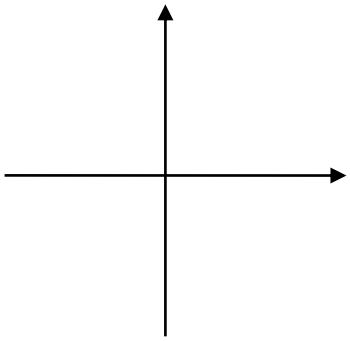
6.

$y \geq -2x + 4$

$y \leq |x - 4|$

x	y

x	y



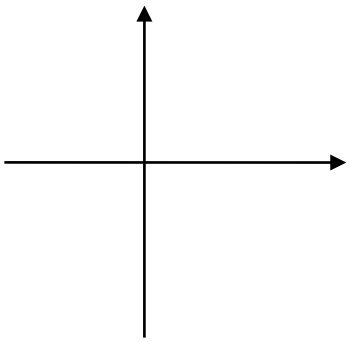
7.

$y \geq 3$

$y > -|x + 2| + 5$

x	y

x	y



Short Summary#1:

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EX 2 – FINDING MAXIMUM AND MINIMUM

Vertex Theorem:

The **maximum** or **minimum** value of

$f(x, y) = ax + by + c$

on a polygonal convex set occurs at a vertex of the polygonal boundary.

Find the maximum and minimum value for each function with the given vertices.

a. $f(x, y) = 4x + 2y$

A(0, 0), B(0, -4), C(3, -5), & D(8, 0)

b. $f(x ,y) = x – 5y + 3$

J(1, 0), K(1, 9), L(6, -2), & M(8, 5)

c. $f(x, y) = 4y + 7x – 1$

R(-2, -1), S(-2, 0), T(-1, 10), U(3, 1) & V(7, 10)

Find the maximum and minimum values for the polygonal convex set, defined by the system of inequalities.

a. $f(x, y) = 4x - 3y + 7$

$x \geq 0$

$y \geq 1$

$x + y \leq 4$

EX.2 - APPLICATION

1. An entrance exam has two parts, a verbal part and a mathematics part. You can score a maximum total of 1600 points. For admission, the school of your choice requires a math score of at least 600. Write a system of inequalities to model scores that meet the school's requirements. Then solve the system.

2. Another school requires a math score of at least 550 points and a total score of at least 1100 points. You can score up to 800 points on each part. Write and solve a system of inequalities to model scores that meet the school's requirements.

3. Jenna spends at most 150 minutes a night on math and science homework. She spends at least 60 minutes on math. Write and solve a system of inequalities to model how she allots her time for these two subjects.

Short Summary #2:

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