CHAPTER 7: SYSTEMS OF EQUATIONS & INEQUALITIES

Section 5 - Linear Inequalities

OBJECTIVES

❑ I can graph linear inequalities

❑ I can write and use linear inequalities to model real situations

2/5/2015

VOCABULARY

Inequalities	Linear Inequalities	Solution to a linear inequality
A way to compare two expressions using $\leq, \geq, <, >$	A region of the coordinate plane that has a boundary line	An ordered pair that makes the inequality true (there are infinitely many!!!)
		Example
Graph on a _____	Graph on a _____	

NOTES
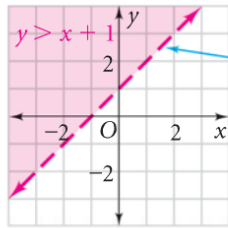# PART 1: LINEAR INEQUALITIES

Just as you have used inequalities to describe graphs on a number line, you can use inequalities to describe regions of a coordinate plane.

Number line
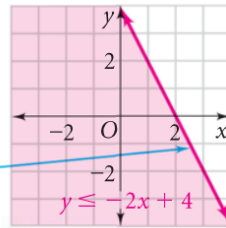$x < 1$

Coordinate plane
$x < 1$
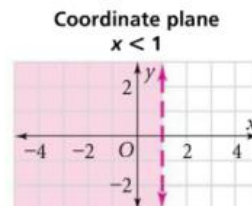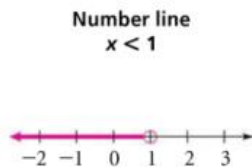
PART 1: LINEAR INEQUALITIES

A **linear inequality** describes a region of the coordinate plane that has a boundary line. The **solutions of an inequality** are the coordinates of the points that make the inequality true.

Each point on a *dashed* boundary line is not a solution.

Each point on a *solid* boundary line is a solution.

PART 1: LINEAR INEQUALITIES

Graphing Inequalities

Number Line		Coordinate Plane	
Symbol	**Circle**	**Symbol**	**Line**
> or <	o	> or <	← – – – – – →
≥ or ≤	●	≥ or ≤	←————→
Symbol	**Direction (only if variable is on the left!!)**	**Symbol**	**Direction (only if equation is in y = mx +b!!)**
> or ≥	Arrow right	> or ≥	Shade above
< or ≤	Arrow left	< or ≤	Shade below

PART 1: LINEAR INEQUALITIES

example: Determine which ordered pairs are solutions to the linear inequality $2x - 3y < 15$

(2, 5)	(-1, -7)	(3, -4)	(0, 0)

PART 1: LINEAR INEQUALITIES

## ONE method to solve a Linear Inequality: Graphing!!

Steps for Graphing Linear Inequalities:

Step 1: Write the inequality in _____ form!

Step 2: Graph the inequality.

    *Use a _____ line for < or > symbols.

    *Use a _____ line for ≤ or ≥ symbols.

Step 3: Use a _____ _____ to determine which side of the line to shade.

All the points within the shaded region represent solutions to the inequality!!!
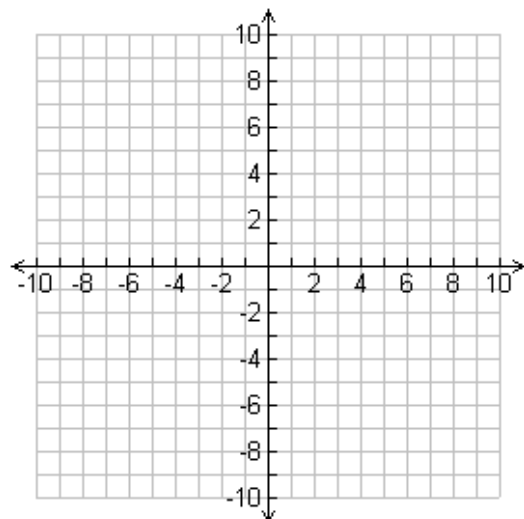
PART 1: LINEAR INEQUALITIES

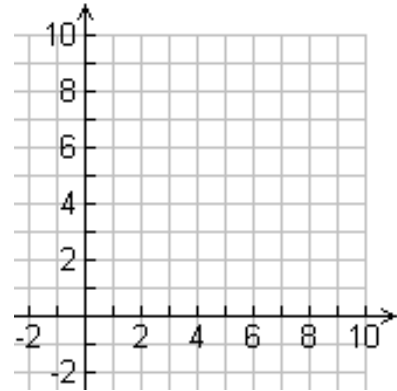**Graph:**

$y > 3x + 2$
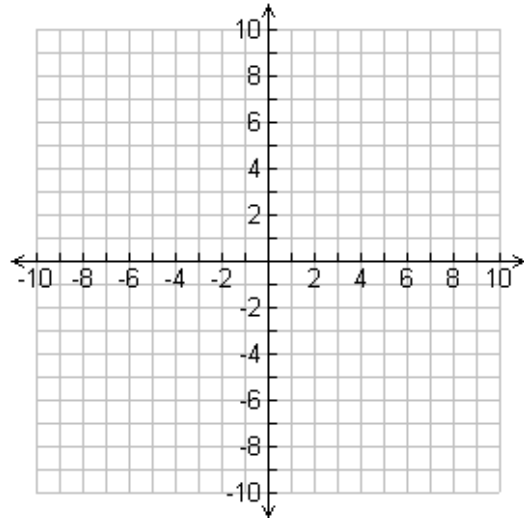
PART 1: LINEAR INEQUALITIES

Graph:

$3x - 5y \leq 10$

PART 2: REAL SITUATIONS

Cooking Suppose you plan to spend no more than $24 on meat for a cookout. At your local market, hamburger costs $3.00/lb and chicken wings cost $2.40/lb. Find three possible combinations of hamburger and chicken wings you can buy.

CAN YOU?? PROVE IT!!

- ❏ I can graph linear inequalities
- ❏ I can write and use linear inequalities to model real situations

Budget Suppose you are shopping for crepe paper to decorate the school gym for a dance. Gold crepe paper costs $5 per roll, and blue crepe paper costs $3 per roll. Your budget allows you to spend at most $48 for crepe paper. How many rolls of gold and blue crepe paper can you buy without exceeding your budget?

Let x = the number of rolls of blue crepe paper.
Let y = the number of rolls of gold crepe paper.

a. Write a linear inequality that describes the situation.
b. Graph the linear inequality.
c. Write three possible solutions to the problem.
d. **Critical Thinking** The point $(-2, 5)$ is a solution of the inequality. Is it a solution of the problem? Explain.