CHAPTER 2.2

SYSTEMS

Cornell Notes/Summary Sheet

Name: _____

Period: _____

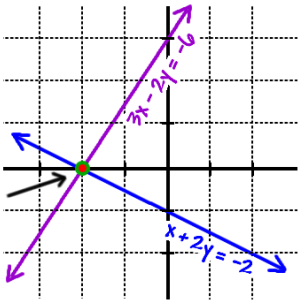
Section 2.4 – Big Ideas

- Systems of two (or more) linear equations
- Inconsistent systems
- Dependent systems
- Graphical method

$x + 2y = -2$

$3x - 2y = -6$

The solution is (-2, 0).



Your Notes

❖ Substitution Method
- ➢ Use when one or both equations is solved for the variable

$3x - 7y = -14$

$x = 2y - 3$

Notice that one of the equations is already solved for x.

Let's stick that X blob into the other equation in place of X:

$3x - 7y = -14$

$x = (2y - 3)$

Solve the resulting equation for y.
Substitute the value of y into the equation for x.

❖ Elimination Method
- ➢ Use when both equations are written in standard form
  - Does addition work?
  - Does subtraction work?
  - Must multiply to make addition work:

$2x - 9y = 8$

$-5x + 8y = -20$

These numbers are easier than the -9 and 8.

We want to make these 10x and -10x:

$5(2x - 9y = 8) \rightarrow 10x - 45y = 40$

$2(-5x + 8y = -20) \rightarrow -10x + 16y = -40$

Solve the resulting system for y:
Substitute the value of y into an equation & solve for x.

Section 2.5 – Big Ideas

- Graphing linear inequalities in two variables
- Systems of linear inequalities
- Bounded & unbounded regions
- Corner points/vertices
- Maximum & minimum values
- Linear programming

Your Notes

$$y < 2x - 6$$
$$y > -3x + 4$$

❖ Replace the inequality symbols with equal signs and graph the straight lines.
- Solid if: $\leq$ or $\geq$
- Dashed if: $<$ or $>$

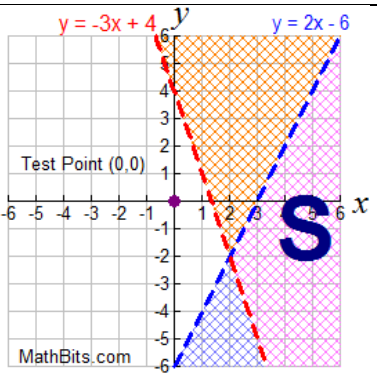
❖ Determine which side of each line will be shaded.
- ➢ Use the test point $(0, 0)$ & shade where true.

$y < 2x - 6$

$0 < 2(0) - 6$

$0 < -6$

False – shade on the other side of the line

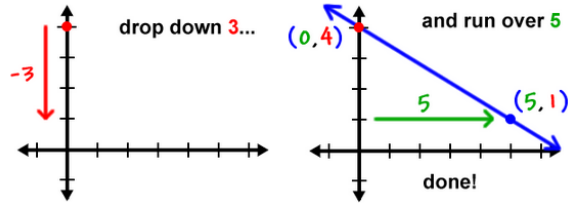


GRAPHING LINES

❖ given slope-intercept form: $y = mx + b$
- ➢ Plot the **Y-INTERCEPT**: $(0, b)$
- ➢ From there, use the SLOPE, m, to determine a second point:
  - If the ***SLOPE IS POSITIVE***, go **UP** the number of units in the NUMERATOR
  - If the ***SLOPE IS NEGATIVE***, go **DOWN** the number of units in the NUMERATOR
  - Always ***GO RIGHT*** the number of units in the DENOMINATOR

Graph $y = \frac{-3}{5}x + 4$

1. It crosses the y-axis at 4, so we start there:
2. the slope is $\frac{-3}{5}$ so we



❖ given standard form: $Ax + By = C$
- ➢ Find the ***X-INTERCEPT***: $(x, 0)$
  - Let $y = 0$
  - Solve for x.
- ➢ Find the ***Y-INTERCEPT***: $(0, y)$
  - Let $x = 0$
  - Solve for y.
- ➢ Plot these points; connect with a line.

OR, first rewrite in SLOPE-INTERCEPT FORM

1. Move x-term to other side.
$$5x - 3y = 2$$
$$-5x \quad -5x$$
$$-3y = -5x + 2$$
2. Divide by y's coefficient.
$$\frac{-3y}{-3} = \frac{-5x + 2}{-3}$$
$$y = \frac{-5x}{-3} + \frac{2}{-3}$$
3. Simplify.
$$y = \frac{5}{3}x - \frac{2}{3}$$