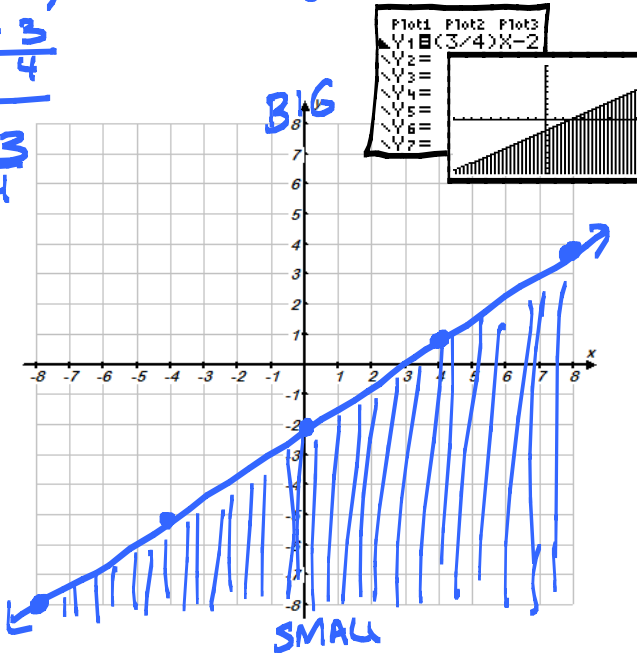


1. Graph the following inequalities:

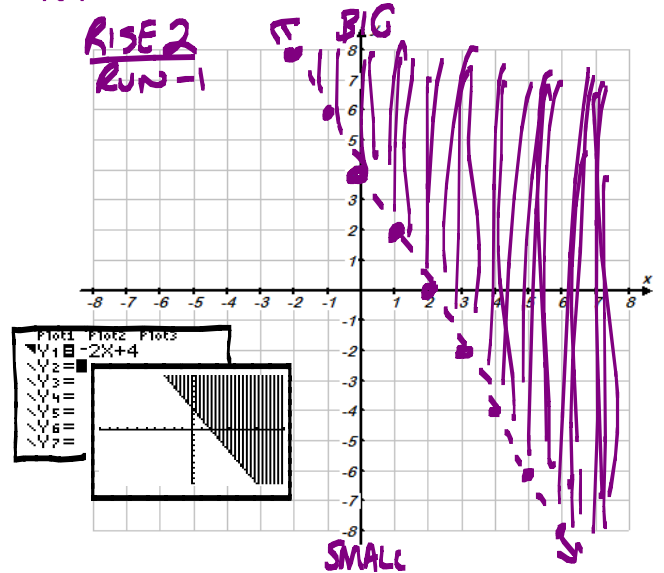
a.  $y \leq \frac{3}{4}x - 2$  START AT -2 ON Y-AXIS

RISE 3  
RUN 4  
- OR -  
RISE -3  
RUN -4



b.  $y > -2x + 4$  START AT 4 ON Y-AXIS

RISE -2  
RUN 1  
RISE 2  
RUN -1



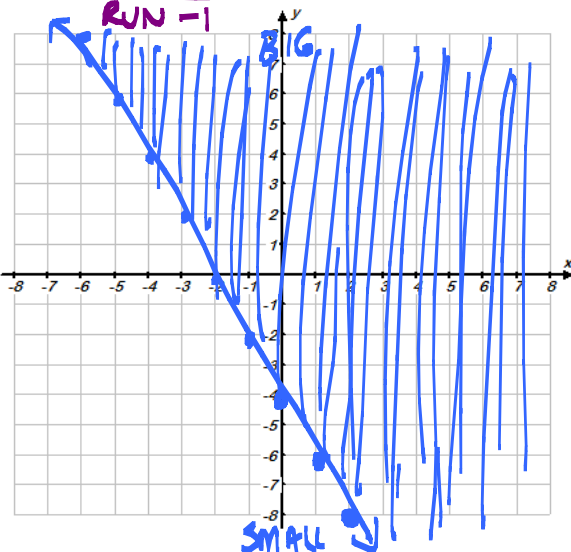
c.  $3y + 9x \geq 3x - 12$  FIRST, PUT IT IN SLOPE-INT FORM BY SOLVING FOR "Y".

$$\frac{3y}{3} \geq \frac{-6x - 12}{3}$$

$y \geq -\frac{2}{3}x - 4$

RISE -2  
RUN 3  
OR  
RISE 2  
RUN -3

START AT -4 ON Y-AXIS

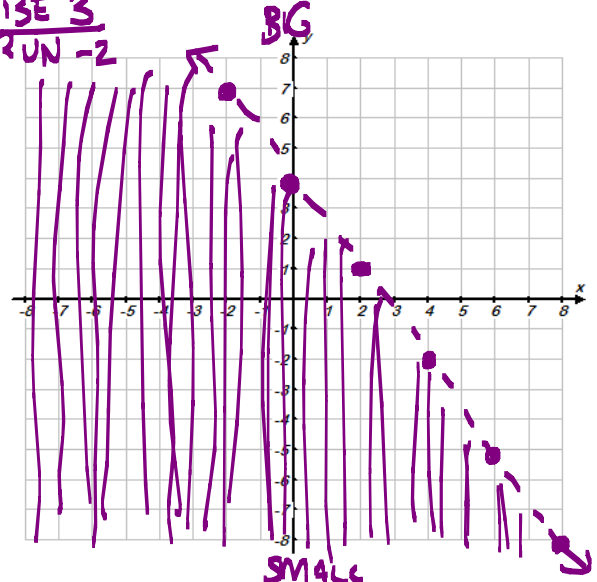


d.  $\frac{3x - 8}{-2} < \frac{-2y}{-2}$  SINCE WE DIVIDED BOTH SIDES BY A NEGATIVE, WE NEED TO FLIP THE INEQUALITY.

$-\frac{3}{2}x + 4 > y$

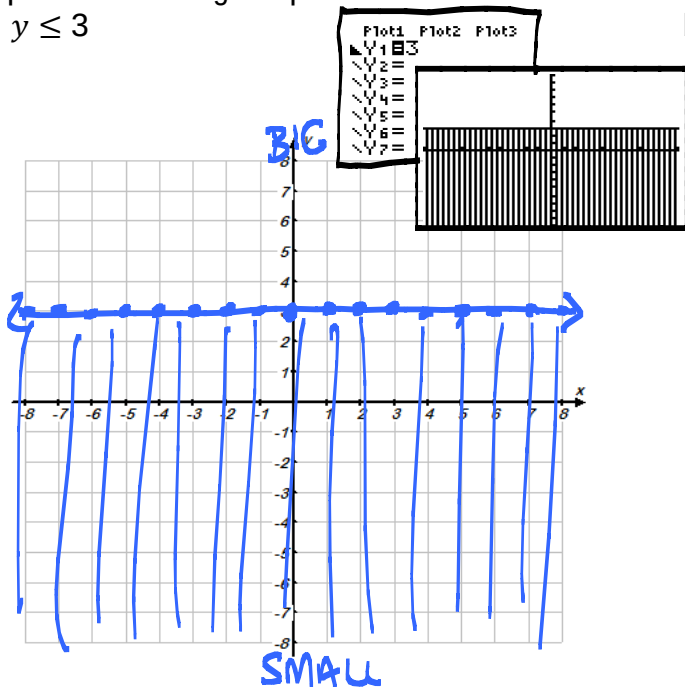
RISE -3  
RUN 2  
OR  
RISE 3  
RUN -2

START AT 4 ON Y-AXIS

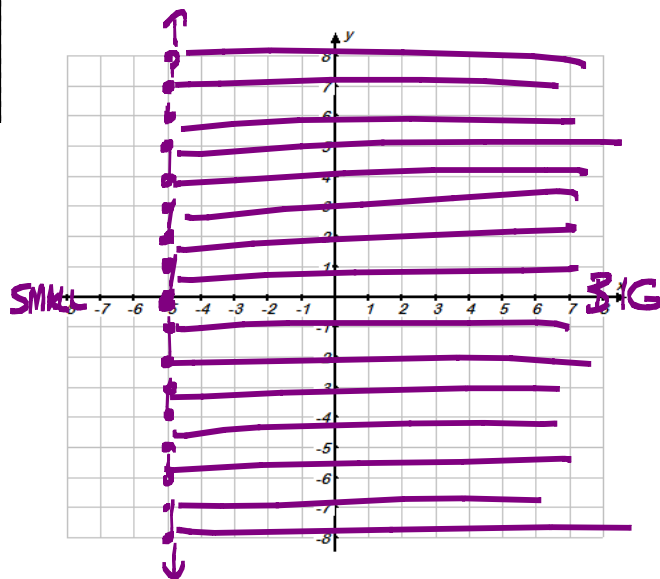


2. Graph the following inequalities:

a.  $y \leq 3$



b.  $x > -5$



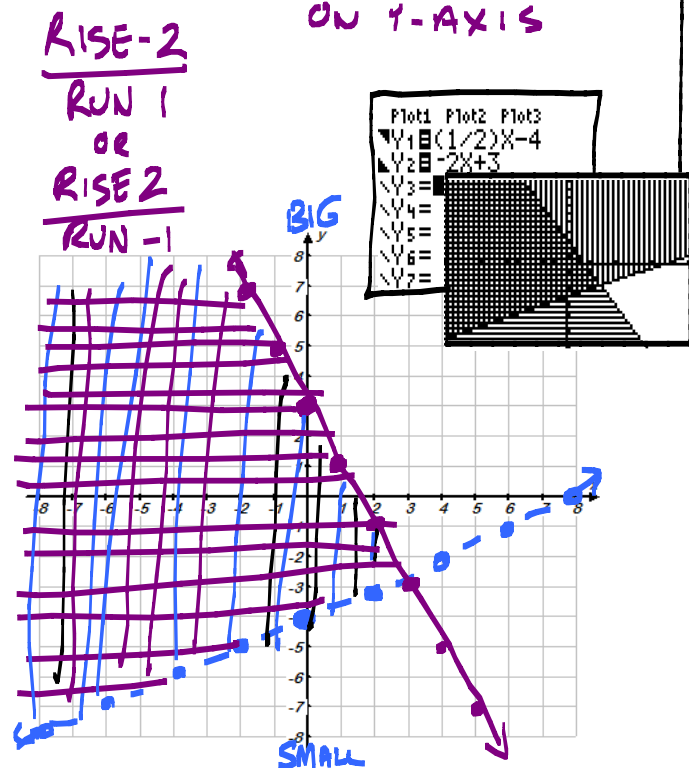
3. Graph the following systems inequalities:

a.  $y > \frac{1}{2}x - 4$  ← START AT -4 ON Y-AXIS

$$\begin{aligned} -2x &\geq y - 3 \\ +3 & \quad +3 \\ \hline -2x + 3 &\geq y \end{aligned}$$

↑ ↑ START AT 3 ON Y-AXIS

RISE 1  
RUN 2  
OR  
RISE -1  
RUN -2



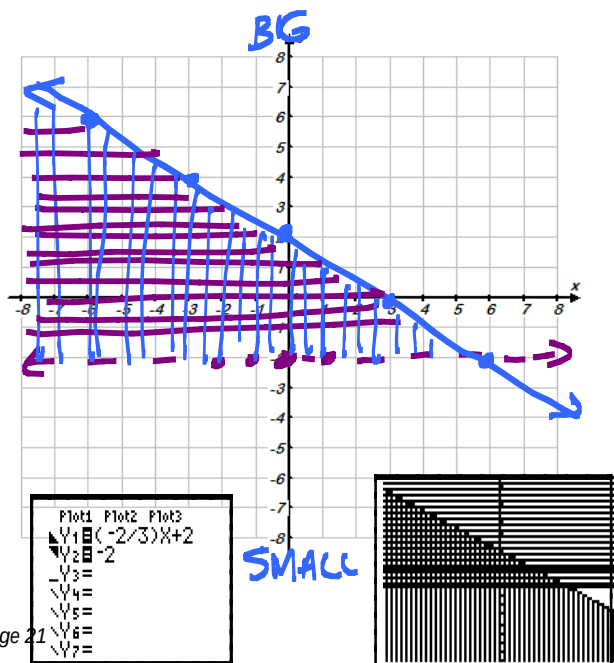
b.  $3y + 2x \leq 6$

$$\begin{aligned} 3y &> y - 4 \\ -y & \quad -y \\ \hline 2y &> -4 \\ \frac{2y}{2} &> \frac{-4}{2} \\ y &> -2 \end{aligned}$$

$$\begin{aligned} 3y + 2x &\leq 6 \\ -2x & \quad -2x \\ \hline 3y &\leq -2x + 6 \\ \frac{3y}{3} &\leq \frac{-2x + 6}{3} \\ y &\leq -\frac{2}{3}x + 2 \end{aligned}$$

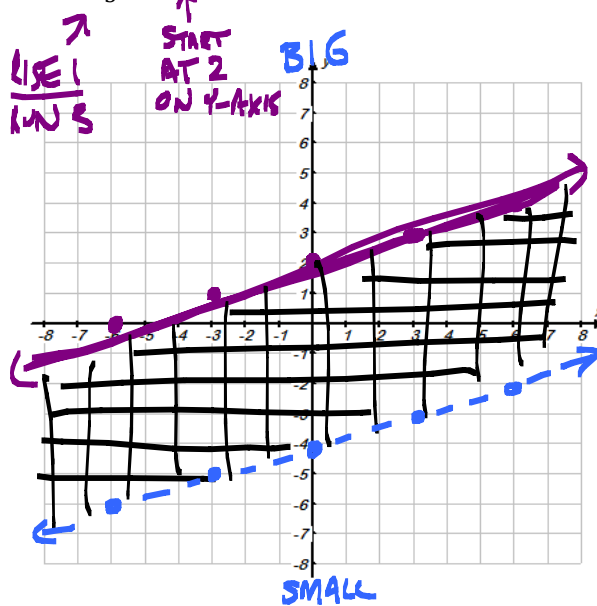
↑ ↑ START AT 2 ON Y-AXIS

RISE -2  
RUN 3



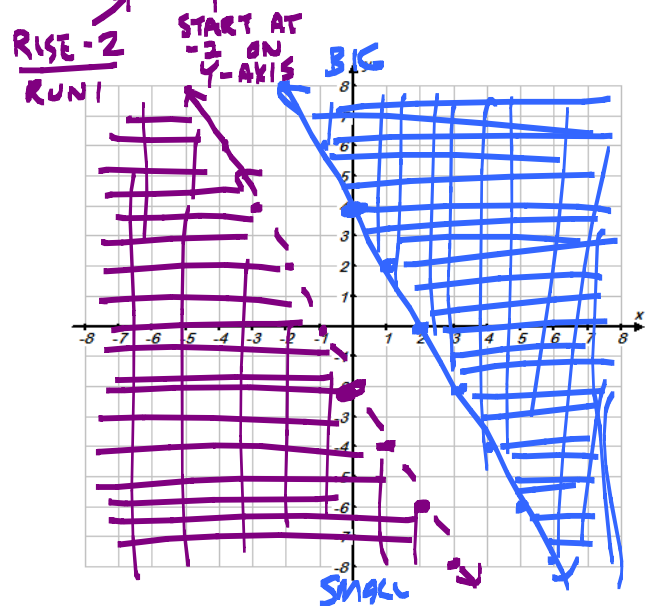
4. Graph the following systems inequalities:

a.  $y > \frac{1}{3}x - 4$   $\leftarrow$  START AT -4 ON Y-AXIS  
 $y \leq \frac{1}{3}x + 2$   $\leftarrow$  RISE 1 RUN 3



b.  $y \geq -2x + 4$   
~~-OR-~~  
 $y < -2x - 2$

START AT 4 ON Y-AXIS  
 RISE -2 / RUN 1 OR RISE 2 / RUN -1



5. Mary works at two part-time jobs. The first job at Bull's Eye pays \$12 per hour and her second job at CSV pays \$10 per hour. She must earn at least \$360 a week to pay her bills.

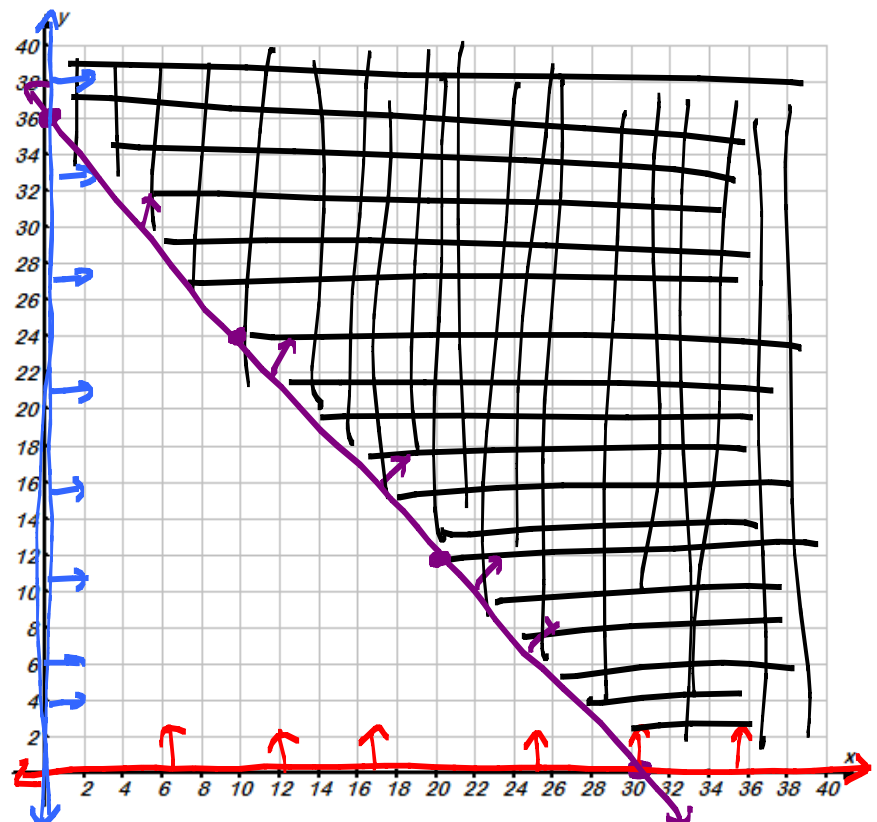
- a. Write an inequality that shows how much she could work at each job to earn at least \$360 per week. Let 'x' be the number of hours she works at Bull's Eye and 'y' be the number of hours she works at CSV.

$$\begin{array}{r} 12x + 10y \geq 360 \\ -12x \qquad -12x \\ \hline 10y \geq -12x + 360 \\ \frac{10y}{10} \geq \frac{-12x + 360}{10} \\ y \geq -\frac{6}{5}x + 36 \end{array}$$

- b. Write base inequalities suggesting that she must work zero hours or more at each job.

$$x \geq 0 \quad y \geq 0$$

- c. Graph the system of inequalities to show the possible number of hours she could work at each job.



6. A company is building computers. The company is making an **economical version (x)** and a **professional version (y)**. The company has enough parts to make 10 computers for the day. They have 3 employees building computers. They each work 8 hour days. Therefore, the company has a total of 24 hours to assemble the computers. The **economical computer takes 2 hours** to build and install software. The **professional version takes 4 hours** to build and install software.

- a. Write an inequality that shows the company can only make a maximum of 10 computers.

$$\begin{array}{rcl} x + y & \leq & 10 \\ -x & & -x \end{array} \quad y \leq -x + 10$$

- b. Write an inequality that shows the company can only has 24 hours of time to use to build the computers.

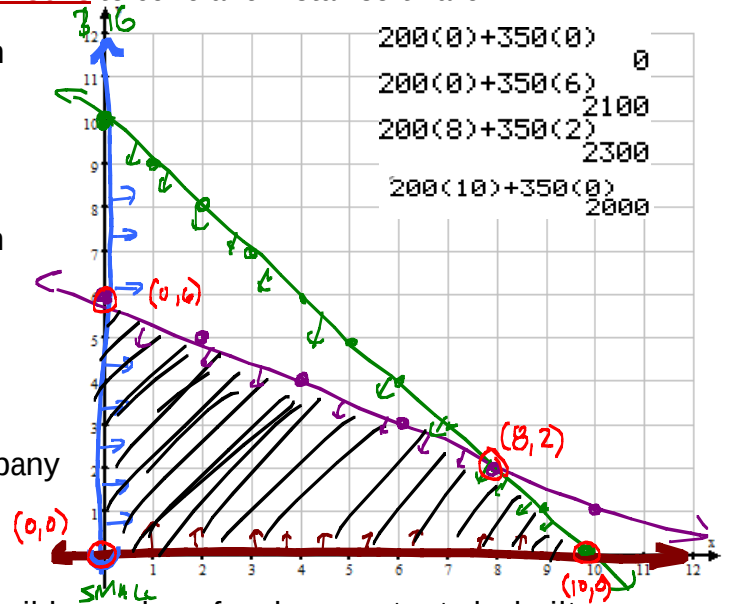
$$\begin{array}{rcl} 2x + 4y & \leq & 24 \\ -2x & & -2x \end{array} \quad y \leq -\frac{1}{2}x + 6$$

$$\frac{4y}{4} \leq \frac{-2x + 24}{4} \quad y \leq -\frac{1}{2}x + 6$$

- c. Write base inequalities suggesting that the company must make 0 or more computer of each type.

$$x \geq 0 \quad y \geq 0$$

- d. Graph the system of inequalities to show the possible number of each computer to be built.



- e. The company nets a profit of \$200 on the economical computers and \$350 on the professional. Create an objective function to determine how many of each should be built to maximize profit?

$$f(x, y) = 200x + 350y \quad \text{TO MAXIMIZE PROFIT} \quad 1 - \text{ECONOMICAL} \quad 2 - \text{PROFESSIONAL}$$

7. A carpenter is required **to make at least 2 large designer tables (x)** and **at least 1 small table each week (y)**. It takes **6 hours to make a large table** and **4 hours to make the smaller table**. The carpenter only works 40 hours per week.

- a. Write an inequality that shows the collective time spent building the tables must be less than 40 hours.

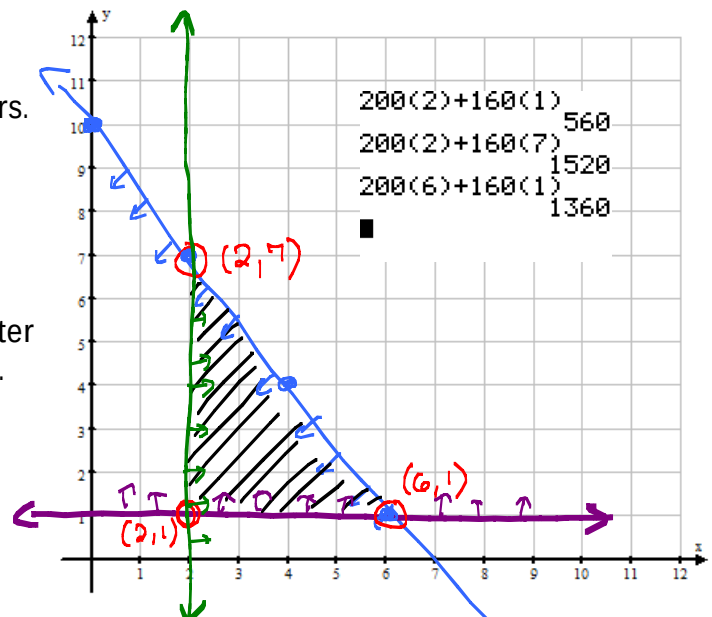
$$\begin{array}{rcl} 6x + 4y & \leq & 40 \\ -6x & & -6x \end{array} \quad y \leq -\frac{3}{2}x + 10$$

$$\frac{4y}{4} \leq \frac{-6x + 40}{4} \quad y \leq -\frac{3}{2}x + 10$$

- b. Write base inequalities suggesting that the carpenter must make at least 2 large tables and 1 small table.

$$x \geq 2 \quad y \geq 1$$

- c. Graph the system of inequalities to show the possible number of each table to be built.



- d. The company nets a profit of \$200 on the large table and \$160 on the small table. Create an objective function to determine how many of each should be built to maximize profit?

$$f(x, y) = 200x + 160y$$

$$f(2, 1) = 200(2) + 160(1) = 560$$

$$f(2, 7) = 200(2) + 160(7) = 1520$$

$$f(6, 1) = 200(6) + 160(1) = 1360$$

THE PROFIT POTENTIAL IS MAXIMIZED WHEN THE CARPENTER BUILDS 2-LARGE AND 7-SMALL TABLES