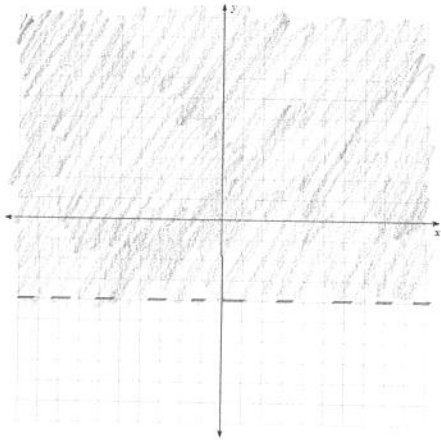


SEC 4 TS  
Half Plane Review  
March 2017

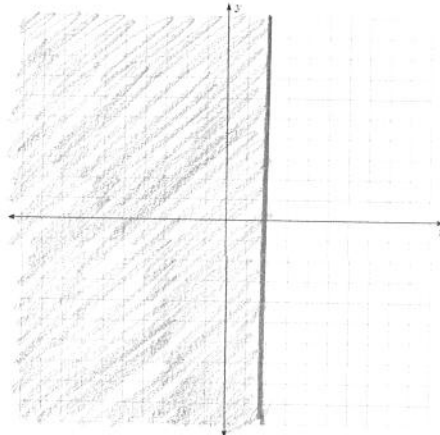
1. Graph the following inequalities.

a)  $y > -4$



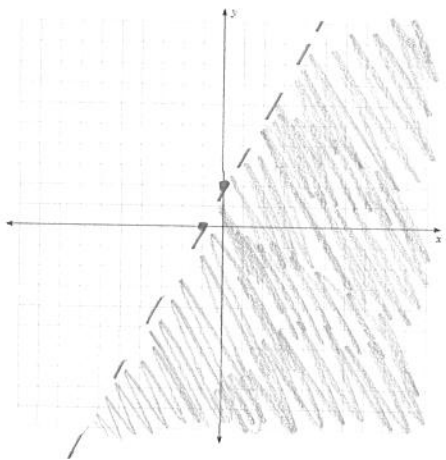
$0 > -4$   
TRUE

b)  $x \leq 2$



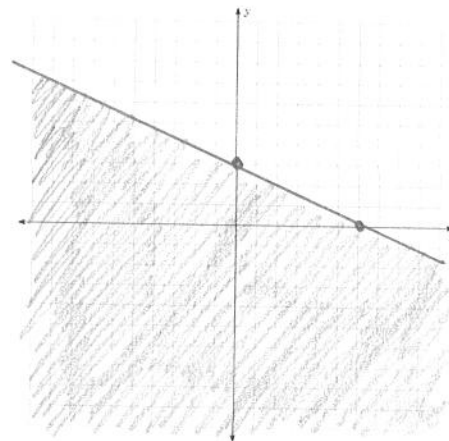
$0 \leq 2$   
TRUE

c)  $y < 2x + 1$   $(0, 1)$



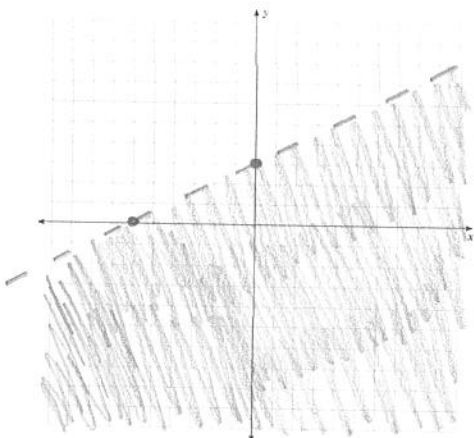
$0 = 2x + 1$   
 $-1 = 2x$   
 $x = -\frac{1}{2}$   
 $(-\frac{1}{2}, 0)$   
 $0 < 2(0) + 1$   
 $0 < 1$   
TRUE

d)  $x + 2y \leq 6$



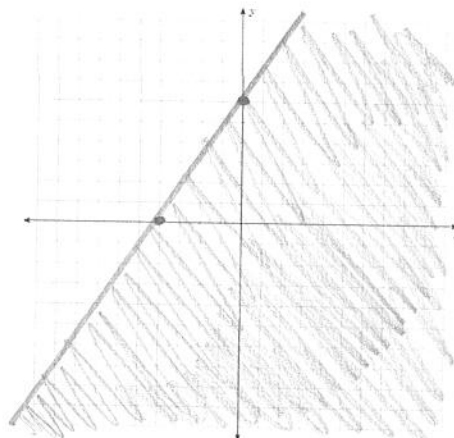
$y \leq -\frac{x}{2} + 3$   $(0, 3)$   
 $0 = -\frac{x}{2} + 3$   
 $-3 = -\frac{x}{2}$   
 $x = 6$   
 $(6, 0)$   
 $0 \leq -\frac{0}{2} + 3$   
 $0 \leq 3$   
TRUE

e)  $2x - 4y > -12$   $y < \frac{1}{2}x + 3$   $(0, 3)$



$0 = \frac{1}{2}x + 3$   
 $-3 = \frac{1}{2}x$   
 $x = -6$   
 $(-6, 0)$   
 $0 < \frac{1}{2}(0) + 3$   
 $0 < 3$   
TRUE

f)  $-3x + y \leq 24$

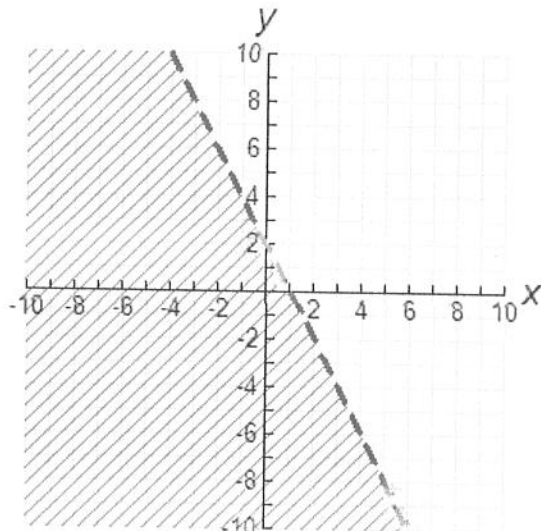


$y \leq 3x + 24$   $(0, 24)$   
 $0 = 3x + 24$   
 $-24 = 3x$   
 $x = -8$   
 $(-8, 0)$   
 $0 \leq 3(0) + 24$   
 $0 \leq 24$   
TRUE

SEC 4 TS  
Half Plane Review  
March 2017

2. Determine the inequality from each of the following graphs.

a)



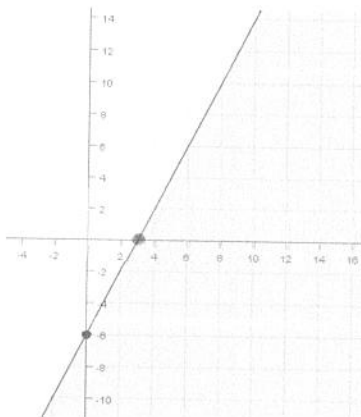
$$\begin{array}{l} (0, 2) \\ (1, 0) \end{array} \quad \frac{2-0}{0-1} = \frac{2}{-1}$$

$$y = -2x + b$$

$$y = -2x + 2$$

$$y < -2x + 2$$

b)



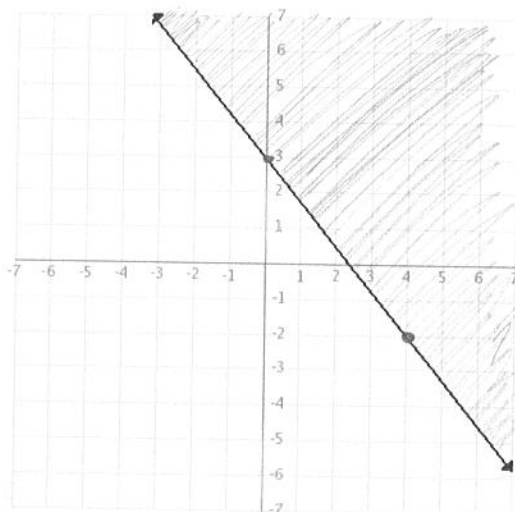
$$\begin{array}{l} (3, 0) \\ (0, -6) \end{array} \quad \frac{-6-0}{0-3} = \frac{-6}{-3} = 2$$

$$y = 2x + b$$

$$y = 2x - 6$$

$$y \leq 2x - 6$$

c)



$$\begin{array}{l} (0, 3) \\ (4, -2) \end{array} \quad \frac{-2-3}{4-0} = \frac{-5}{4}$$

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

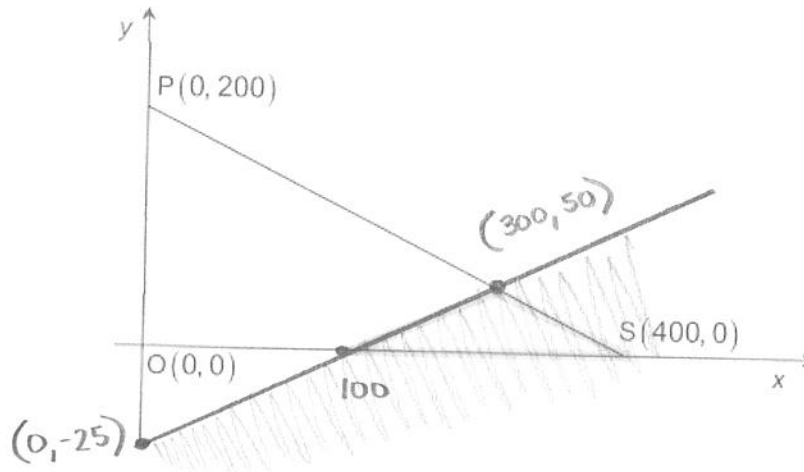
$$y = \frac{-5}{4}x + 3$$

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

SEC 4 TS  
Half Plane Review  
March 2017

3. A city wants to redevelop one of its parks. Triangle POS below represents the location of this park in the Cartesian plane. The scale of this graph is in metres. This year, the city wants to redevelop the portion of the park located in the half-plane described by the inequality  $x - 4y \geq 100$

What is the area of the portion of the park that the city wants to redevelop this year?



$$\begin{aligned} \textcircled{1} \quad x - 4y &\geq 100 \\ -4y &\geq -x + 100 \\ y &\leq \frac{1}{4}x - 25 \end{aligned}$$

$$(0, -25)$$

$$\textcircled{2} \quad 0 = \frac{1}{4}x - 25$$

$$25 = \frac{1}{4}x$$

$$x = 100$$

$$(100, 0)$$

$$\begin{aligned} \textcircled{3} \quad \text{Test Point} \\ 0 &\leq \frac{1}{4}(0) - 25 \\ 0 &\leq -25 \\ \text{FALSE} \end{aligned}$$

$$\textcircled{4} \quad \overline{PS}$$

$$(0, 200) \quad (400, 0)$$

$$\frac{200 - 0}{0 - 400} = \frac{200}{-400} = -\frac{1}{2}$$

$$y = -\frac{1}{2}x + 200$$

$$\textcircled{5} \quad -\frac{1}{2}x + 200 = \frac{1}{4}x - 25$$

$$225 = \frac{3}{4}x$$

$$x = 300$$

$$y = 50$$

$$\begin{aligned} \textcircled{6} \quad \text{Base} &= 400 - 100 \\ &= 300 \end{aligned}$$

$$\text{Height} = 50$$

$$A = \frac{300 \cdot 50}{2}$$

$$\boxed{A = 7500 \text{ m}^2}$$

SEC 4 TS  
Half Plane Review  
March 2017

3. Which shaded region represents the solution set of the inequality  $2y + x > -8$ ?

$$2y > -x - 8$$

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

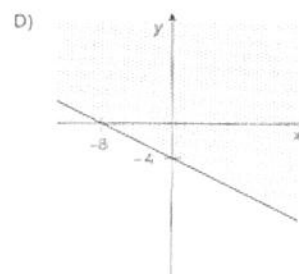
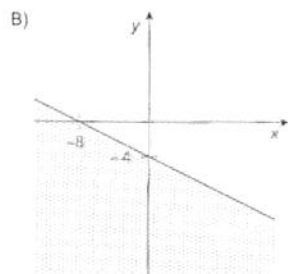
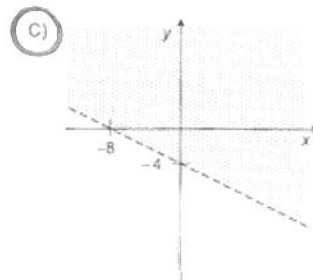
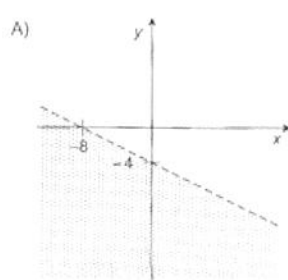
$$(0, -4)$$

$$0 = \frac{-x}{2} - 4$$

$$4 = \frac{-x}{2}$$

$$x = -8$$

$$(-8, 0)$$



DOTTED!

$$0 > \frac{(0)}{2} - 4$$

$$0 > -4$$

TRUE

4. In the Cartesian Plane, which graph represents the solutions of the inequality  $-9x + 7y < 315$ ?

$$7y < 9x + 315$$

$$y < \frac{9x}{7} + 45$$

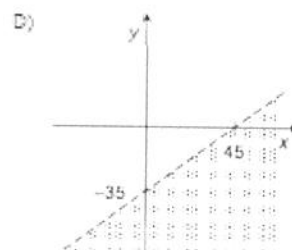
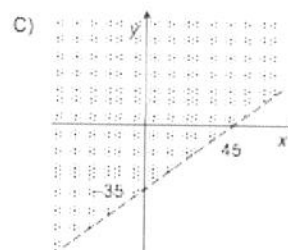
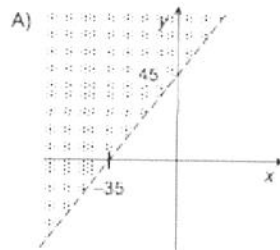
$$(0, 45)$$

$$0 = \frac{9x}{7} + 45$$

$$-45 = \frac{9}{7}x$$

$$x = -35$$

$$(-35, 0)$$



DOTTED!

$$0 > \frac{9(0)}{7} + 45$$

$$0 > 45 \quad \text{TRUE}$$