

Newberger, College Algebra 112-9, Spring 2005

**Worksheet: Graphing linear inequalities in the plane.**

Consider the set  $S = \{(x, y) | \frac{1}{2}x + \frac{2}{3}y \geq 10\}$ .

- Is  $(0, 0)$  in  $S$ ? How can you tell?
  
- Is  $(2, 3)$  in  $S$ ? How can you tell?
  
- Is  $(4, 12)$  in  $S$ ? How can you tell?
  
- Name a point in  $S$  with negative  $x$ -coordinate. \_\_\_\_\_
- Name a point in  $S$  with integer coordinates (other than the one above). \_\_\_\_\_
- On the grid, plot all 5 points listed above, using  $\bullet$  for points in  $S$  and  $\times$  for points not in  $S$ . Make sure to choose a scale for your graph so that all of the points above fit on the diagram.

Now you will graph  $S$  on the same graph that you plotted the points.

- Write the equation for the line that will be the boundary of the set  $S$ .
  
  
  
  
  
  
  
  
  
  
- Put the line in slope-intercept form. (This involves solving for  $y$ .)  
What is the slope? \_\_\_\_\_ What is the  $y$ -intercept? \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
- Find the  $x$ -intercept of the line. (This involves substituting  $y = 0$  into the formula for your line, and solving for  $x$ . Do you know why that gets you the  $x$ -intercept? )
  
  
  
  
  
  
  
  
  
  
- Graph the line.
- Shade  $S$ .