

### Exam 1 Review sheet

#### I. Lines.

- A. You will be asked to graph a line. You may be given the formula for the line, or you may have to do this as part of graphing a system of inequalities.
- B. You will be asked to determine the formula of a line give its graph.
- C. You will be asked to find the slope and  $y$ -intercept of a line. You may have to put a line in slope intercept form.
- D. You will be asked to find where two lines intersect, and to find the  $x$ -intercept of a line (which is the same as finding where the line intersects the line  $y = 0$ .)

#### II. Inequalities. In addition to the problems in homework, there is a link to a site with a worksheet full of graphing problems with solutions on the course web site.

- A. You will be asked to graph sets given in set builder notation both on the number line and in the plane. Sets that you will graph on the number line are determined by one variable, like

$$\{x|2x + 5 < 10x\},$$

and sets that you will graph on the plane will be determined by two variables, like

$$\{(x, y)|2y \leq 3x + 19 \text{ and } x + y < 2\} \quad \text{or} \quad \{(x, y)|y > 0\}.$$

- B. You may be asked to write the set builder notation for a set, given its graph (in the plane or on the line).
- C. You will have to solve linear inequalities, possibly as a stand alone problem, and almost certainly as part of a larger exercise. Do not forget to switch the inequality when multiplying or dividing by negative numbers.

#### III. Functions and Modeling.

- A. You will be asked to create functions of one variable that model geometric situations. See for example page 302 #1-18.
- B. You will be asked to identify ratios in word problems.
- C. You will be asked to create functions of one and two variables from word problems using ratios. For example, suppose a certain type of bottle holds 1.5 gallons. The ratio involved is  $\frac{1.5 \text{ gallons}}{1 \text{ bottle}}$ . The function that models the number of bottles it takes to hold  $x$  gallons is given by

$$f(x) = \frac{1 \text{ bottle}}{1.5 \text{ gallons}}(x \text{ gallons}),$$

or simply  $f(x) = x/1.5$ .

- D. You will be asked to evaluate functions at specific values, and to explain what evaluated functions represent verbally. For example, the function  $A(l, w) = lw$  models the area of a rectangle with side length  $l$  and width  $w$ . This function  $A(l, w)$  evaluated at the point  $(2, 4)$  is  $A(2, 4) = 2 * 4 = 8$ . Verbally  $A(2, 4)$  represents the area of a rectangle with length 2 and width 4.

#### IV. Linear Programming.

- A. You may be asked to find the maximum and minimum of a linear objective function over a given feasible region. See for example problems 1-4 on page 509. For this you need to find the value of the objective function at the vertices of the feasible region.
- B. You will be asked to solve a linear programming word problem that involves maximizing profit or minimizing costs.