Chapter 1 Expectations

Chapter 1 should be mostly review. There are a few concepts in chapter 1 that you may not have encountered in your algebra classes, these concepts will be presented in class.

NOTE: Whenever you see the word “communicate”, it is implied that it means to communicate both verbally and in writing!

Section 1 Expectations for Coordinate Systems and Graphs

Be able to do the following:

1. Communicate to your instructor that you know what a graph of an equation represents.
2. Communicate to your instructor that you know what it means when a point satisfies an equation; also be able to communicate to your instructor, what it means when a point does not satisfy an equation.
3. Know that when a point satisfies an equation, then the point is a solution to the equation. Also know that when a point does not satisfy an equation, then the point is a not a solution to the equation. (Example 2 on page 3)
4. Determine if a given point is on a graph of a given equation WITHOUT using the graph of the equation. (Example 2 on page 3)
5. Write the equation of a vertical line when given a graph of a vertical line.
6. Recognize an equation whose graph is a vertical line.
7. Communicate to your instructor that you know the format of a linear equation that is written in (what the authors call) a “general form”.
8. Identify linear equations that are written in “general form”.
9. Memorize the definition of the “standard form” of a linear equation and be able to communicate the definition to your instructor.
10. Communicate to your instructor that you know the format of a linear equation that is in (what the authors call) a “standard form”.
11. Identify linear equations that are written in “standard form”.
12. Convert a linear equation that is written in “general form” to a linear equation that is written in “standard form”. (Example 6 on page 6)
13. Find the y-intercept and the x-intercept when given a linear equation written in standard form. (Examples 7 and 8 on pages 5 and 6)
14. Graph (i.e. sketch) a linear equation using the x- and y- intercepts. (Examples 7 and 8 on pages 5 and 6)
15. Find the value of the slope and find the $y$-intercept when given a linear equation that is
written in “standard form”. NOTE: Technically the value of $b$ is NOT the $y$-intercept!
The value of $b$ is the $y$-coordinate of the $y$-intercept. The $y$-intercept is the point where
the graph of the line intersects the $y$-axis; $(0, b)$ is the technically the $y$-intercept.
(Examples 6 and 7 on pages 4 and 5, AND Example 1 on page 24)

16. Interpret both the $x$-intercept and $y$-intercept when given a linear equation that is
associated with a word problem. Interpreting the $x$-intercept and $y$-intercept means to
describe what they represent in simple non-mathematical terms. (Example 8 on pages 5
and 6).

17. Graph several linear equations on your calculator and be able to transfer the graph that
you see on your calculator to a piece of paper. Be able to label the graphed lines either
with the corresponding $x$- and $y$-intercepts, or with the standard form of the linear
equations.

18. Write an equation for a horizontal line from a graph of a horizontal line.

19. Recognize an equations whose graph is a horizontal line.

20. Memorize the three steps for graphing an equation in “standard form”

Section 2 Expectations for Linear Inequalities

Be able to do the following:

1. Memorize and communicate to your instructor the purpose of the two properties of the
inequality that are listed on pages 10 and 11.

2. Take a linear inequality that is written in “general form” and solve it for a specified
variable.

3. Communicate to your instructor that you know the format of a linear inequality that is
written in “general form”.

4. Identify linear inequalities that are written in “general form”.

5. Communicate to your instructor that you know the format of a linear inequality that is in
“standard form”.

6. Identify linear inequalities that are written in “standard form”.

7. Describe the difference between a linear inequality that is written in “general form” and a
linear inequality that is written in “standard form”.

8. Convert a linear inequality that is written in a “general form” to a linear inequality that is
written in “standard form”.

9. Memorize these two steps to graphing a linear inequality. (The blue-gray box on page 12)

   Step 1: Draw the graph of the $y = mx + b$.

   Step 2: Shade (i.e. cross off) the portion of the plane that does NOT satisfy the inequality. NOTE: This is most likely different from the way you learned it in your previous math class(es). There is a reason for this change that will be explained in class.

10. Graph a linear inequality using the two steps listed above.

11. Graph a system of linear inequalities (i.e. several linear inequalities) on a single graph.

12. Communicate to your instructor that you know what a feasible set is and what it represents.

13. Locate the feasible set when a system of linear inequalities is graphed.

14. Determine if the point is in the feasible set or not WITHOUT the use of the graph of the system of linear inequalities. (Example 9 on page 15)

**Section 3 Expectations for the Intersection Point of a Pair of Lines**

**Be able to do the following:**

1. Find the point of intersection of two lines that intersect. There are many methods that may be used to find the point of intersection. You may use the method that is described in the textbook or another method that you may have learned in any of your previous classes.

2. Communicate to your instructor that you know the difference between a supply curve and a demand curve.

3. When given a supply curve and a demand curve, determine both the quantity and price at which the item will sell (without using the graph of the two curves).

4. Use the graphing functions of the calculator to find the intersection of two specified lines.
Section 4 Expectations for the Slope of a Straight Line

Be able to do the following:

1. Find the value of the slope when given a linear equation that is in “standard form”.

2. Memorize the geometric definition of the slope and be able to use it to find the slope of a line when given two points that are on the line.

3. Memorize the steepness property and know how it is used to interpret the value of the slope.

4. When you are told what the variables represent in an equation that is written in “standard form”, use the steepness property to interpret the slope in simple terms. Interpreting the slope means to be able to describe what the value of the slope signifies in the context of the problem (i.e. to simplify the explanation without complicated mathematical jargon).

5. Find the equation of the line when given a point and a slope of a line that goes through the point. You can use the point-slope formula or the alternative method that will be described in class using $y = mx + b$.

6. Find the equation of a line that passes through the two given points.

7. Find a slope of a line that is perpendicular to a given line.

8. Find a slope of a line that is parallel to a given line.

9. Recognize word problems that contain information about two points. (Exercises 63, 64, 65, 66, 68, 69, and 70 on pages 33 and 34).

10. When given a word problem that contains information for two points and there are no variables defined in the problem, be able to do the following:

   A. Pick the letters that you want to use for the variables. Most of the time, $x$ and $y$ are used, but you will see the textbook occasionally uses some other letters such as $t$, $p$, and $q$ for some special situations.

   B. Define (in very specific terms) what each variable represents. Your definitions should be very specific and indicate the units that are attached to the values of the variables (distance, currency, time, etc.).

   C. Find the equation of the line using any information from sections 1 and 4 of chapter 1.