Math 115 for Spring 2018

Chapter 2: Linear Equations in Two Variables, Functions

Sections to be covered: 2.1 to 2.7 except skip 2.4.
Section 2.4 is only for those intending to take Math 129.
The key sections are 2.3 and 2.6.

Boxes containing important rules and procedures:
pp. 129, 136, 147, 150 (both), 158, 162, 183, 192, 193, 205, 207, 208

Section 2.1: see example 1, p. 129; example 2, p. 130; example 5, p. 134; tip at the bottom of p. 137.
Practice problems: p. 140, prob. 11; p. 141, prob. 21; p. 144, prob. 59.
Formulas on pages 129 and 136.
Homework: p. 140: 12; p. 141: 22; p. 142: 34; p. 144: 50, 52, 58; p. 145: 60.

Section 2.2: see example 2, p. 147; tip on top of p. 148; p. 155, p. 5.
Important formulas: page 147 and both on page 150.
Homework: p. 154: 16, 42; p. 155: 54, 60; p. 156 66; p. 157: 70, 74.

Section 2.3: see exercises 1–8, p. 158–164; tip on page 163; p. 167, prob. 21; p. 182: 23–26.
Important formulas: page 158 and page 162.
Homework: p. 167: 10, 12, 26; p. 168: 28, 34, 38, 42, 50; p. 169: 62.

Section 2.4: skip completely.
Students heading to Math 129 are encouraged to learn it on their own.

Section 2.5: important definition is on page 183.
Important ideas in text: from bottom half of p. 184 to top 1/5 of p. 185.
Homework: page 189: 16, 18, 20.

Section 2.6 all of this section, particularly examples 1 and 2; 2.6.3 including tip on page 194; example 5.
Important definition and test are on pages 192 and 193.
Homework: page 200: 12, 14, 16; page 201: 42, 44, 48, 62; page 203: 90.

Section 2.7 Impt. definitions and graphs on pp. 205, 207, and 208.

Good examples in Chapter Summary:
p. 220: examples 1 and 3; p. 221: examples 1 and 2; p. 224: example 4

Key Review Exercises: pp. 225–229: 8, 12, 14, 20, 22, 28, 38, 54

Key Test Exercises: pp. 231–233: 9, 10, 14, 16, 19, 25, 38

Key Cumulative Review Exercises:
P. 233–4: 12, 13, 14, 18, 19, 21
p. 316: 17
p. 420: 9, 11
p. 494: 19
p. 661: 15, 18, 21

Key Skills and Key Problems are found on the next page.

Key Skills

A student (after Chapter 2) should be capable of the following:

- plotting points in the rectangular coordinate system.
- recognizing the standard form of a linear equation.
- graphing a linear equation in two variables, including finding the x- and y-intercepts.
- graphing horizontal and vertical lines.
- finding the slope of a line.
- determining the slopes of lines parallel and perpendicular to a given line.
- working with the slope-intercept and point-slope formulas of a line.
- finding the domain and range of a given function.
- understanding what defines a function and what $f(x)$ means.
- recognizing the graphs of some common basic functions and determining their intercepts and asymptotes.

Key Problems

1. Plot each point and state the quadrant or axis (or axes) where it is located.
   (a) $(-2, 4)$ (b) $(7, -2)$ (c) $(0, -5)$ (d) $(3, 0)$ (e) $(0, 0)$
2. Consider the equation $-3x + 4y = 12$.
   (a) Is this equation in standard form?
   (b) Find the x- and y-intercepts.
   (c) Use the intercepts to draw the graph.
   (d) Find any point on the line segment connecting the intercepts and add it to your graph.
   (e) Is the point $(-4, 4)$ on the graph?
3. True or false.
   The equation $x = 7$ is a horizontal line with slope $= 0$ and it has exactly one y-intercept.
4. Find an equation of the line passing through the points $(-9, 7)$ and $(1, 1)$. Write the answer in slope-intercept and in point-slope form.
5. Solve for y. $3x + 2y = 8$.
6. Consider the equation $2x - 6y = 30$.
   (a) Write the equation of the line in slope-intercept form.
   (b) Find the slope and y-intercept.
   (c) Graph the equation using the slope and the y-intercept.
   (d) Determine the slope of a line that is perpendicular to $2x - 6y = 30$.
7. Describe in a short sentence the property that makes a relation a function.
8. Consider the equation $y = |x|$.
   (a) Find the domain and the range.
   (b) Describe the graph in words. (Do not graph).
   (c) Use the vertical line test to decide if it is a function. Explain the result in words. (Do not graph).