

## GUIDED NOTES – 4.1 LINEAR FUNCTIONS

### LEARNING OBJECTIVES

In this section, you will:

- Represent a linear function.
- Determine whether a linear function is increasing, decreasing, or constant.
- Interpret slope as a rate of change.
- Write and interpret an equation for a linear function.
- Graph linear functions.
- Determine whether lines are parallel or perpendicular.
- Write the equation of a line parallel or perpendicular to a given line.

### REPRESENTING LINEAR FUNCTIONS

Study the box in your textbook section titled “linear function.”

- Write the slope-intercept form of a line below.
  
- $b$  represents the \_\_\_\_\_ and  $m$  represents the \_\_\_\_\_.
- The y-intercept is at \_\_\_\_\_.

### DETERMINING WHETHER A LINEAR FUNCTION IS INCREASING, DECREASING, OR CONSTANT

Study the box in your textbook section titled “increasing and decreasing functions.”

- When is  $y = mx + b$  a(n):
  - Increasing function: \_\_\_\_\_
  - Decreasing function: \_\_\_\_\_
  - Constant function: \_\_\_\_\_

**Homework:** You should now be ready to attempt problems 1-3 in “Homework – Section 4.1” on WeBWork.

### INTERPRETING SLOPE AS A RATE OF CHANGE

Study the box in your textbook section titled “calculate slope.”

- Give the formula used for calculating the slope, or rate of change, of a function.

- Write out the 3 step process for calculating and interpreting the slope, given two points from a linear function.
  - 1.
  - 2.
  - 3.

**Try It:** Read Example 3 in the text, then answer the following.

If  $f(x)$  is a linear function, and  $(2,3)$  and  $(0,4)$  are points on the line, find the slope. Is this function increasing or decreasing?

**Homework:** You should now be ready to attempt problems 4-5 in “Homework – Section 4.1” on WeBWork.

### **WRITING AND INTERPRETING AN EQUATION FOR A LINEAR FUNCTION**

- Write out the 4 step process for writing an equation to represent the function, given the graph of a linear function.
  - 1.
  - 2.
  - 3.
  - 4.

**Try It:** Read Examples 5, 6, and 7 in the text, then answer the following.

If  $f(x)$  is a linear function, with  $f(2) = -11$ , and  $f(4) = -25$ , find an equation for the function in slope-intercept form.

**Homework:** You should now be ready to attempt problems 6-8 in “Homework – Section 4.1” on WeBWork.



Study the box in your textbook section titled “horizontal and vertical lines.”

- Give the equations for the following types of lines:

1. Horizontal Line

2. Vertical Line

### WRITING THE EQUATION OF A LINE PARALLEL OR PERPENDICULAR TO A GIVEN LINE

**Try It:** Read Example 20 in the text, then answer the following.

Given the function  $h(x) = 2x - 4$ , write an equation for the line passing through  $(0,0)$  that is

a. Parallel to  $h(x)$

b. Perpendicular to  $h(x)$

**Try It:** Read Example 21 in the text, then answer the following.

A line passes through the points  $(-2, -15)$  and  $(2, -3)$ . Find the equation of a perpendicular line that passes through the point  $(6, 4)$ .

**Homework:** You should now be ready to attempt problems 9-12 in “Homework – Section 4.1” on WeBWork.