

# Homework 3

Math 147 (section 501–502-503), Spring 2015

This homework is due on Wednesday, February 4.

0. Read Sections 1.3 and 3.1
1. Complete the following sentences, and show any work you do.
  - (a) Assume that  $a$  and  $c$  are positive real numbers. The \_\_\_\_\_ plot of the exponential function  $y = c \cdot a^x$  is a straight line with slope \_\_\_\_\_ and  $y$ -intercept \_\_\_\_\_.
  - (b) Assume that  $r$  is a real number and  $b$  is a positive real number. The \_\_\_\_\_ plot of the power function  $y = b \cdot x^r$  is a straight line with slope \_\_\_\_\_ and  $y$ -intercept \_\_\_\_\_.
2. Use graph transformations to graph  $y = 1 - |x|$ .
3. Draw an example of a graph of a function  $f(x)$  with  $f(-1) = 1$  and  $\lim_{x \rightarrow -1} f(x) = 8$ .
4. Section 1.3 # 10, 26, 32, 44, 52, 58, 64, 84, 94, 98
5. Section 3.1 # 10, 30, 34, 42, 50, 54
6. (These problems are *not* to be turned in!)
  - (a) Section 1.3 #2, 17, 20, 23, 27, 33, 37, 43, 47, 51, 55, 59, 65, 93, 97
  - (b) Section 3.1 #3, 15, 21, 25, 29, 37, 47, 49
7. (These problems are *not* to be turned in!) For each function below, determine the value of  $a$  for which  $f(x)$  has a limit at  $x = 0$ .

(a)

$$f(x) = \begin{cases} 0 & \text{if } x \leq 0 \\ x + a & \text{if } x > 0 \end{cases}$$

(b)

$$f(x) = \begin{cases} x + a & \text{if } x < 0 \\ 1 & \text{if } x \geq 0 \end{cases}$$

(c)

$$f(x) = \begin{cases} 2 & \text{if } x \leq 0 \\ (x - 1)^2 + a & \text{if } x > 0 \end{cases}$$