

Homework 3

Math 147, Fall 2017

This homework is due on Thursday, September 14.

0. Read Sections 1.3 (including “Graphing and basic transformations of functions” in 1.3.1) 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)

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