

## Math 135, Calculus 1, Fall 2020

### Written Homework 2: Due Friday September 11

**Directions:** Write your solutions neatly and clearly, and submit to Canvas. In these problems, you should show all of your work in complete mathematical "sentences", writing complete English sentences when you explain your logic. You are free (and encouraged!) to work with others, but make sure the solutions you write up your solutions independently.

**Exercise 1.** Fill in the blank with "all", "no", or "some" to make the following statements true.

- If your answer is "all", explain why.
- If your answer is "no", given an example and explain.
- If your answer is "some", give two examples that demonstrate when the statement is true and when it is false. Explain your examples.

Note: an example must include either a graph or a specific function.

- For \_\_\_ real numbers  $x$ ,  $(x + 2)^4 = x^4 + 16$ .
- For \_\_\_ real numbers  $x$ ,  $\sqrt{x^4 + 8x^2 + 16} = x^2 + 4$ .
- For \_\_\_ real numbers  $x$ , if  $(x + 2)(x - 3) = 2$ , then  $x + 2 = 2$  and  $x - 3 = 2$ .
- For \_\_\_ functions  $f$  and  $g$ , if  $f$  and  $g$  are both even functions, then  $f + g$  is even.
- For \_\_\_ triples of real numbers  $k$ ,  $x$ , and  $y$ , if  $x < y$ , then  $kx < ky$ .

**Exercise 2.** An electric company charges its customers a fixed base charge of \$6 per month, plus 10 cents per kilowatt-hour (kWh) for the first 400 kWh, 11 cents per kWh for the next 500 kWh, and 15 cents for all additional kWh.

- Express the monthly cost  $E$  as a function of the amount  $x$  of electricity used.
- Graph the function  $E$  for  $0 \leq x \leq 2000$ .
- Explain how your graph represents your function  $E$ .