

MATH 131: Reflection Homework 4

Due: Wednesday, October 5 in class

NOTE: Don't forget to write out and sign the Honor Code at the top of your reflection homework:

"I affirm that I have adhered to the Honor Code in this assignment."

1. For this assignment, you must create a catalog of functions that satisfy the following properties. Your catalog must satisfy the following conditions:

- (1) For each property, you must find two or more different functions that satisfy that property using functions we have discussed in class.
- (2) Your functions must have domain and range that are sets of numbers, ie: that can be graphed.
- (3) For each function that you list under the property, sketch a graph of the function and explain in 1-3 sentences why it satisfies the property.

Here is the list of properties:

- Functions whose domain cannot be written as a single interval
- Functions whose domain consists of all real numbers
- Functions that are *periodic*, meaning their behavior repeats itself over time: for all values of x in the domain and for some fixed real number k , $f(x + k) = f(x)$.
- Functions that are increasing over part of their domain and are decreasing over another part of the domain
- Functions that are always decreasing (from left to right)
- Functions that have multiple x-intercepts
- Functions that pass the *horizontal* line test: any horizontal line intersects the graph of the function at at most one point.
- Functions whose range does not go to ∞ *and* does not go to $-\infty$, ie: for which the range lies in some interval of finite length.