MATH 490, Spring Semester, 2021 - Week 1 - Gregg

Name:_____ Score:_____

Instructions: Show all of your work to receive full credit, making sure that all work and answers are legible.

1. Give an example of functions with concavity $1, 2, 3, 0, -1, -2, -3$.

2. Let f be a function with concavity 1. Sketch a graph of that function. Find the equation of the secant line passing through the points $(1, f(1))$ and $(2, f(2))$. Compute the area of the region enclosed by the graph of f and this secant line.

3. Repeat the preceding problem for another secant line through the points $(x, f(x))$ and $(x + 1, f(x + 1))$.

4. Next, let f be a function with concavity 2 or 3. Sketch a graph of that function. Find the equation of the secant line passing through the points $(1, f(1))$ and $(2, f(2))$. Compute the area of the region enclosed by the graph of f and this secant line.

5. What do you conclude about the relationship between concavity and the area between a curve and its secant line?