

Math 106 Fall 2019 Chapter 2 Written HW Due Tuesday Oct. 15th

Your work should be written NEATLY on a separate sheet of paper. If there are multiple pages, please STAPLE all pages together. Do NOT fold over the corner. Place the completed homework under my door (Thompson 311) or take a picture of each page and email it to me.

- 1: Let $f(x)$ be a function whose derivative is $f'(x) = \sqrt{5x^2 + 1}$. Show that the graph of $f(x)$ has an inflection point at $x = 0$
- 2: For what value of x does the function $f(x) = \frac{1}{4}x^2 - x + 2$, $0 \leq x \leq 8$, have its maximum value?
- 3: A closed rectangular box with a square base is to be constructed using two different types of wood. The top is made of wood costing \$3 per square foot and the remainder is made of wood costing \$1 per square foot. If \$48 is available to spend, find the dimensions of the box of greatest volume that can be constructed.
- 4: For $f(x) = 2x^3 + 3x^2 + 1$, find the intervals of increase and decrease, extrema, concavity and points of inflection.
- 5: For $f(x) = \frac{x}{5} + \frac{20}{x} + 3$, ($x > 0$), find the intervals of increase and decrease, extrema, concavity and points of inflection.