

## Week 6: June 16<sup>th</sup> - June 22<sup>nd</sup>

### Suggested Problems

*Problems you may find instructive, or that I find interesting.*

§4.2 #3, 9, 17, 35, 43, 45, 53, 57, 59 & 60

(Hint: for #45 use MVT; for #59 use induction)

(These problems were suggested last week.)

§4.3 #9, 19, 23, 27, 35, 36, 43 & 51

(You do not need to graph #51.)

(These problems were suggested last week.)

§4.4 #13, 17, 19, 23, 29, 34, 38 & 39

(Hint: there are examples that satisfy #34.)

(Don't skimp on #38. Use theorems and prove your result.)

§4.5 #5, 19, 23, 30, 33, 44, 53 & 59

§4.6 #4, 11, 21, 29, 35, 41 & 49(B)

(Reminder: function must be continuous at point of inflection.)

§4.7 #15, 29, 31, 35, 45 & 51. Also try:

**X1.** Find any/all asymptotes of  $y = x^2 \sin\left(\frac{1}{x}\right) - 5$ .

§4.8 #13, 19, 33, 39, 51, 55 & 57

### Assigned Problems

Due **June 23<sup>rd</sup>**, in lecture.

1. Find the local and absolute extremes of,

$$f(x) = \sqrt{x} e^{\left(\frac{1}{x^2 + \frac{1}{2}}\right)} \quad \text{for } x \in [0, +\infty).$$

*Hint: When solving  $\frac{df}{dx} = 0$ , factor out  $\sqrt{x}$ .*

2. An aircraft is flying northward searching for wreckage on the strip of ocean between 100m and 300m to the east. How high should the aircraft fly to maximize the apparent (angular) size of the search strip?

*Hint: Use the formula for  $\tan(A - B)$ . Explain why maximizing  $\tan(A - B)$  is the same as maximizing  $A - B$ . This is (essentially) problem §4.5 # 46.*

3. Graph  $g(x) = \frac{(1-x)^3}{x^2}$ . Label your axes and clearly indicate: intercepts, local extremes, any points of inflection, and the equations of asymptotes.