Section 4.3: What Derivatives Tell Us

MATH 130: Calculus I

Due: Thursday, April 11, 2019 at 1:30pm Name (Print): _____

After reading Section 4.3 (pages 257-266 in the text), respond to the following questions **on this handout**. Be sure to staple your pages together before turning it in. **You must answer all parts to all questions to earn full credit!!!** See the salmon homework guidelines handout for details. You are encouraged to take additional notes wherever you are keeping your class notes.

Response Section

1. State Theorem 4.7: Test for Intervals of Increase and Decrease.

2. Explain carefully why it makes sense to look at the first derivative of a function $f(x)$ to determine where f is increasing and where f is decreasing (i.e. why does Theorem 4.7 make sense?). (Hint: think about what the derivative is!)

3. State the First Derivative Test (Theorem 4.8).

4. (a) State the definitions of concavity and inflection point.

   (b) Draw a picture of a continuous function that is concave up on $(-\infty, 0)$ and concave down on $(0, \infty)$. Label the inflection point.

5. State the Theorem 4.9: One Local Extremum Implies Absolute Extremum.

6. State the Second Derivative Test, Theorem 4.11.

7. What does the Second Derivative Test help you identify?

Questions/Exercise Section

8. Write down at least two questions you have on the reading. OR if you have NO questions, do exercise 22 in Section 4.3 (page 267). Be sure to show all steps for full credit! See the salmon homework guidelines handout for details.

Reflection Section

9. Write **two or three** sentences reflecting on the progress of your recent work in the course. See the salmon homework guidelines handout for details.

Time Section

10. How much time did you spend on this reading assignment? _____