

Calculus

Date:

Items Needed: .Book,

Objective: The students will determine what increasing and decreasing functions are and how to use the first derivative test.

Lesson:

- Draw a function on the board that is in the shape of a u with a flat bottom.
- Discuss what you think increasing and decreasing mean.
- A function is increasing if, as x moves to the right, its graph moves up, and is decreasing if its graph moves down.
- Looking at the function from above, if I would look at the slope of the decreasing side, what could you tell me? (It would be negative.)
- From the increasing side? (It would be positive).
- That is how theorem 3-5 is developed, If $f'(x) > 0$ then f is increasing.
- If $f'(x) < 0$ then f is decreasing and if $f'(x) = 0$ then f is constant.

- Draw a function that has some S in it.
- From previous sections what have you learned to look for. (critical numbers)
- To find an open interval on a function look for the critical numbers. Start from neg. infinity and go to the first critical number and then to the next critical number and so forth down the line.
- If you are not given the graph you will have to use the derivative to determine whether the function is increasing or decreasing. Have students make up a function to show this example. (Pick a number within the interval containing the critical numbers to find out whether the derivative is neg. or pos.)

- According to peaks and valleys, how would we determine a relative min or max only using increasing or decreasing parts of a function?
- Refer to the First derivative test theorem. Remember, you may not have a min or max at every point because it could be increasing – increasing or decreasing – decreasing between critical points.
- Do example 2.
- Do example 3.
- Do example 4.
- Do number 42, p. 233.

Assignment: Have students do 1, 2, 3, 6, 22 26, 31, 38, 41, 43, p. 233

Evaluation: (Could be from any one/several of the following)

Responses from classroom questions
Results of classroom sample problems
Homework responses
Check answer with Calculator
End of the section exam

Enrichment: