

# Calculus

**Date:**

**Items Needed:** .Book

**Objective:** The students will determine how to find extrema and critical numbers.

**Lesson:**

- Define what an extrema is. Refer to theorem 3.1.
- A function need not have a minimum or a maximum on an interval, look at figure 3.1a and b.
- Continuity can also play an important role as in 3.1c.
- Put up the extreme value theorem.
  
- Relative maximum- you can think of a relative maximum as occurring on a hill on the graph and a relative minimum as occurring in a valley on the graph.
  
- If the hill or valley is smooth and rounded, the graph has a horizontal tangent line at the high point or low point. If the hill or valley is sharp and peaked, the graph represents a function that is not differentiable at the high or low point.
  
- Look at example 1 and look how the derivatives of extrema shape up.
- What general conclusion can you tell me about the derivative of maximums or minimums?
- Def of Critical Number – If the derivative is equal to 0 or is undefined for a value of  $x$  (domain of  $x$ ) it is a critical number of  $f$ .
- Relative Extrema occur only at critical numbers.
  
- Put up the guidelines for finding extrema p. 215.
  
- Do example 2
- Do example 3
- Do example 4

**Assignment:** Have students do 21, 26, 30, 36, 37, 42, 43, 49, 62, 65, 66, p. 217

**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:**