SHOW ALL WORK TO RECEIVE CREDIT. Put a box around your answers.

1. Locate the absolute extrema of the on the closed interval [–40,40].
2. Determine whether Rolle's Theorem can be applied to on the closed interval [2,3]. If Rolle's Theorem can be applied, find all numbers *c* in the open interval (2,3)such that .
3. For  on (0,2π), find the intervals where the function is increasing and decreasing as well as any relative extrema.
4. For , find the intervals where the function is increasing, decreasing, and constant. State its relative maximums and relative minimums.

1. The function  describes the motion of a particle moving along a line.

a) Find the velocity function of the particle at any time *t*;

b) Identify the time intervals when the particle is moving in a positive direction;

c) Identify the time intervals when the particle is moving in a negative direction; and

d) Identify the times when the particle changes its direction.

1. Find the points of inflection and discuss the concavity of the function on the interval (0,2.
2. Sketch the graph of the function  using the concavity, extrema, intercepts, and asymptotes that you find.
3. Sketch the graph of the derivative of the following function:



1. A rectangular page is to contain 64 square inches of print. The margins on the top and bottom are 2 inches, whereas the sides have 1 inch margins. Find the dimensions of the page such that the least amount of paper is used.
2. A giraffe farmer plans to fence a rectangular pasture adjacent to a deep river. The pasture must contain 180,000 square meters in order to provide enough trees with foliage for the giraffe herd. What dimensions would require the least amount of fencing, provided no fencing is required along the river (Giraffes can’t swim).
3. Use differentials to approximate the value of .
4. Graph . Complete each step using the attached sheet.
5. Graph . Complete each step using the attached sheet. {Think of simple answers for the inflection point}