Online Homework System

Assignment Worksheet
11/23/20 - 6:54:38 PM EST

Name: _____ **Class:** Calculus 1 - MATH*1200 - F20

Class #: _____ **Section #:** _____

Instructor: Mihai Nica **Assignment:** Practice Term Test #5

Question 1: (1 point)

Fill in your name on the academic integrity pledge:
"As a member of the University of Guelph, I pledge to uphold the highest standards of ethics and academic integrity. This means that I will only use my notes, a calculator, and will NOT use any other outside assistance (no internet or other people including my peers). I understand that there are serious consequences, including getting expelled from the course or the university, for violating academic integrity."
Write the phrase "I, --insert name here--, agree to the academic integrity pledge" on the top of your answer for Q1a

Q1a) Draw a graph of a function that has the following properties:

-The domain of the function is a finite interval (i.e. the domain of the function is an interval not involving infinity or minus infinity)

-The function is continuous and differentiable everywhere in its domain

-The function has TWO global minima

-The function has NO global maximum

Be sure to clearly indicate what is the domain of the function in your graph.

Q1b) True or False: Any function which meets all the criteria from Q1a) MUST have a local maximum somewhere in its domain.

(a) False

(b) True

Q2 Let $f(x) = x\ln(x^2)$. Estimate the value of $f(1.2)$ using linear approximation.

Q3 Let $g(x) = x^{\frac{2}{3}}(x-5)$. You may use the fact that $g'(x) = \frac{5(x-2)}{3x^{1/3}}$ and $g''(x) = \frac{10(x+1)}{9x^{4/3}}$.

a) Find any x- and y- intercepts

b) Determine any vertical or horizontal asymptotes.

c) Do a first-derivative analysis. (Find intervals where the function is increasing/decreasing, horizontal/vertical tangents, cusps/corners, any extreme points.)

d) Do a second-derivative analysis. (Find intervals where the function is concave up/down, find any points of inflection.)

e) Draw a sketch of this function using an appropriate scale. Label some key points that you calculated in parts (a) - (d).

Q4 A piece of wire which is 10 m long is cut into two pieces at some point along its length. One piece is bent into a square and the other is bent into a circle. The total area enclosed by the shapes is to be optimized.

a) Set up this problem carefully be sure to clearly explain the variable you are using and what functions you are using.

b) How should the wire be cut so that the total area enclosed is a minimum?

c) How should the wire be cut so that the total area enclosed is a maximum?