Calculus for the Life Science I
MAT1330A , MAT1330B, MAT1330E
Assignment 5

Due date: Oct. 28

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Student Name (printed): _____

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Question 1

Consider the function $f(x) = x^{5/3}e^{-x}$.

a) Find the roots of f to complete the following table.

x	
$f(x)$	

b) Compute the derivative of f.

$f'(x) =$

c) Find the critical points of f to complete the following table.

x	
$f'(x)$	
description[1]	

d) Compute the second derivative of f.

$f''(x) =$

e) Find the inflection points of f to complete the following table.

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[1]Determine where the function is increasing or decreasing, if there are local minimums or local maximums, ...

x	
$f''(x)$	
description[2]	

f) Draw the graph of f.

Question 2

Find the global maximum and minimum of $f(x) = \dfrac{x-1}{x^2+8}$ on the interval $[0,6]$.

Global maximum of [ ] at $x =$ [ ].

Global minimum of [ ] at $x =$ [ ].

Question 3

The size of a population as a function of time is given by the fonction

$$p(t) = 5000 + \frac{200t}{10 + t^3} \quad , \quad t \geq 0 \ .$$

Find the global minimum and maximum of this function for $t \geq 0$.

Global maximum of [ ] at $x =$ [ ].

Global minimum of [ ] at $x =$ [ ].

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[2]Determine if the function is concave up or down, if there are inflection points, ...