

Math 201 Mock Quiz 11

December 2, 2019

Name: _____

Instructions: No calculators. Use provided scrap. Write your fully simplified answers in the space provided.

1. For the function $f(x) = \frac{x^3}{x^2-1}$, you are given (and need not verify) that

$$f'(x) = \frac{x^2(x^2-3)}{(x^2-1)^2} \text{ and } f''(x) = \frac{2x(x^2+3)}{(x^2-1)^3}$$

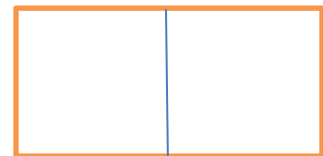
Find, if they exist:

- (a) The domain of $f(x)$: _____
- (b) Its x -intercept(s): _____ (c) Its y -intercept: _____
- (d) Its vertical asymptote(s): _____
- (e) Its horizontal asymptote(s): _____
- (f) Intervals of: increase: _____ decrease: _____
- (g) Local max point(s): _____ Local min point(s): _____
- (h) Intervals of concavity: C.U. on: _____
C.D. on: _____
- (i) Inflection point(s): _____

Do your calculations on the provided scrap paper and sketch the graph of $f(x)$ on the reverse side of this page. Indicated the above features on your graph.

Bonus (Complete the other problems to be eligible):

1. A rectangular corral of 162 square-meters is to be fenced off and then divided by a fence into two sections, as shown in the figure to the right. Label this figure, using x for any horizontal dimensions and y for any vertical dimensions in your set-up.



If the amount of total fencing used is to be minimized, how much fencing is needed? _____ meters