

MATH 131, Fall 2019

Name: \_\_\_\_\_

Quiz 9

11/14/19

Section: \_\_\_\_\_

For full credit you must present a clearly organized solution, showing all supporting calculations. There are two sides to this assignment.

1. Let  $f(x) = \frac{x}{x^2 + 1}$ .

- (a) Find the intervals on which  $f$  is increasing, and the intervals on which  $f$  is decreasing.
- (b) Find the intervals of concavity and any inflection points of  $f$ .
- (c) Find and classify all local extrema using either the first or second derivative tests.
- (d) Determine any asymptotes of  $f$ .
- (e) Use the information gathered in (a)-(d) to sketch a graph of  $f$ .

2. Let  $g(x) = x^2 - 3x^{2/3}$  .

- (a) Find the intervals on which  $g$  is increasing, and the intervals on which  $g$  is decreasing.
- (b) Find the intervals of concavity and any inflection points of  $g$ .
- (c) Find and classify all local extrema using either the first or second derivative tests.
- (d) Determine any asymptotes of  $g$ .
- (e) Use the information gathered in (a)-(d) to sketch a graph of  $g$ .