

KFUPM SEM I (Term 051) Name: _____ Serial #: _____

MATH 101-19 Quiz # 6 ID: #: _____

1. (10-points) Use the first derivative to test the function $f(x) = x^{2/3} - x^{5/3}$ for

(a) Critical numbers.

(b) Increasing or decreasing (state the intervals).

(c) Vertical tangents (if any).

(d) Cusps (if any)

2. (8-points) Use the second derivative to test the function $f(x) = x^6 - 10x^4$ for

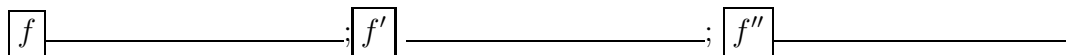
(a) Relative Extrema (if possible).

(b) Concavity (State the intervals).

(c) Inflection points (just mention the x -coordinate of any inflection point).

3. (12-points) Given $f(x) = \frac{3x^2 - 4x - 4}{x^2} = \frac{(3x + 2)(x - 2)}{x^2} \Rightarrow f'(x) = \frac{4(x + 2)}{x^3} \Rightarrow$
 $f''(x) = \frac{-8(x + 3)}{x^4}.$

- (a) Find the sign graphs of f , f' , and f'' :



- (b) Use Part (a) to find, if any, the coordinates of any relative extrema.

- (c) Use Part (a) to find (if any) the coordinates of any inflection point.

- (d) Find all kinds of asymptotes.

- (e) Use all of the above to sketch the graph of f .