

Name: _____

Math 105

Quiz #9

December 2, 2013

- This is a closed-book quiz. No books, notes, calculators, cell phones, communication devices of any sort, or webpages, or other aids are permitted.
- Please *show* all of your work and *justify* all of your answers.

1. [10 Points] Let $f(x) = x^4 + 4x^3$. For this function, discuss domain, vertical and horizontal asymptote(s), interval(s) of increase or decrease, local extreme value(s), concavity, and inflection point(s). Then use this information to present a detailed and labelled sketch of the curve.

2. [10 Points] Let $f(x) = \frac{x^2 - 1}{x^2 - 4}$. For this function, discuss domain, vertical and horizontal asymptote(s), interval(s) of increase or decrease, local extreme value(s), concavity, and inflection point(s). Then use this information to present a detailed and labelled sketch of the curve. **Hint:**

Take my word for it that (you do **not** have to compute these)

$$f'(x) = \frac{-6x}{(x^2 - 4)^2} \quad \text{and} \quad f''(x) = \frac{6(3x^2 + 4)}{(x^2 - 4)^3}.$$