

**Quiz 10**  
Math 140: Calculus I  
Week 10

**Instructions.** No notes, books, or calculators. Show all work clearly. Answers without supporting work may receive little or no credit.

**Curve Sketching Checklist**

To analyze a function  $f(x)$ , determine the following features.

1. Domain
2. Intercepts
3. Vertical asymptotes
4. Horizontal asymptotes using

$$\lim_{x \rightarrow \infty} f(x), \quad \lim_{x \rightarrow -\infty} f(x)$$

5. First derivative  $f'(x)$
6. Critical numbers
7. Increasing/decreasing intervals
8. Local maxima and minima
9. Second derivative  $f''(x)$
10. Concavity and inflection points

1. Consider the following function.

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

Use the curve sketching checklist to analyze the function and sketch its graph.