

Homework # 12
Due Wednesday, January 28
No late papers accepted! No excuses!

1. Let $f(x) = \frac{x^2}{x^2 - 1}$. Remember: Show your work.

Domain _____ Range _____

Intercepts _____ Symmetry _____

Horizontal asymptotes _____

Vertical asymptotes _____

Critical point(s) _____

Inflection point(s) _____

Intervals where graph of f is increasing _____

Intervals where graph of f is decreasing _____

Intervals where graph of f is concave upward _____

Intervals where graph of f is concave downward _____

f'

f''

Sketch the graph.

2. For what values of c does the polynomial $p(x) = x^4 + cx^3 + x^2$ have two inflection points? One inflection point? None? Use Maple to illustrate by graphing P for several values of c .

3. Let $f(x) = \frac{x}{\sqrt{x^2 - 1}}$. Remember show some work.

Domain _____ Range _____

Intercepts _____ Symmetry _____

Vertical Asymptotes _____

Horizontal Asymptotes _____

Critical Point(s) _____ Inflection point(s) _____

Intervals where graph of f is increasing _____

Intervals where graph of f is decreasing _____

Intervals where graph of f is concave upward _____

Intervals where graph of f is concave downward _____

f'

f''

Sketch the graph.

4. Find the area of the largest rectangle that can be inscribed in a semicircle of radius 5.

5. Find the point on the parabola $y = 2x^2$ that is closest to the point (1, 4).