Math 125-Quiz 27
December 5, 2011

You have 10 minutes to complete this quiz. You may use a calculator for arithmetic only. Be careful about justifying your answers and showing your work.

Graph the function

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

Pay attention to the domain of f, any symmetry that f has, and any asymptotes has. State the intervals on which f is increasing, those on which f is decreasing, an any local maximums or minimums. State also where f is concave up or concave down.
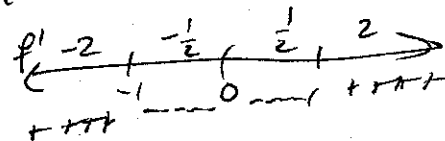
Domain: $x \neq 0$.

Symmetry: f is odd

asymptotes

$H \to \lim_{x \to \infty} f(x) \Rightarrow \infty$ $\Big\}$ no asymptote

$\lim_{x \to -\infty} f(x) \to -\infty$

$V \to @ \; x = 0$

$f'(x) = \dfrac{x(2x) - 1(x^2 + 1)}{x^2} = \dfrac{x^2 - 1}{x^2}$ cv's $0, \pm 1$

local max @ $x = -1$

local min @ $x = 0$

$f''(x) = \dfrac{x^2(2x) - (x^2 - 1)(2x)}{x^4}$

$= \dfrac{2x^3 - 2x^3 + 2x}{x^4} = \dfrac{2}{x^3}$

c down   c up

$f(1) = 2$

$f(1) = -2$