

Assignment #4

Name _____

Due 2 October 2009

1. The point $P(2, 1/5)$ lies on the curve $y = f(x) = 1/(1+x^2)$. In each of the following, a point $Q(x, f(x))$ is specified by a given value for x ; find the slope of the secant line PQ .

(a) $x = 3$

(b) $x = 2.5$

(c) $x = 2.1$

(d) $x = 2.01$

(e) $x = 2.001$

2. Let $f(x) = \frac{x^2 - 5x + 3}{x^3 - x^2}$. In each case, evaluate the infinite limit or explain why the infinite limit does not exist.

(a) $\lim_{x \rightarrow 1} f(x)$

(b) $\lim_{x \rightarrow 0} f(x)$

3. Sketch the graph of a curve satisfying the following conditions:

- $f(0) = 2$
- $f(2) = 1$
- $f(-1) = 2$
- $\lim_{x \rightarrow 0^-} f(x) = 1$
- $\lim_{x \rightarrow 0^+} f(x) = 3$
- $\lim_{x \rightarrow 1} f(x) = +\infty$
- $\lim_{x \rightarrow -1^+} f(x) = 0$