Math 1203 Quiz 6
February 20, 2019

Name: _____
Instructions: No calculators. Answer <u>all</u> problems in the space provided! Do your rough work on scrap paper.

1. Compute the following limits, or write "DNE" if they do not exist. ∞ and $-\infty$ are valid answers:

   (a) $\lim_{x\to -1} \frac{x+1}{x^2+1} =$ _____ (b) $\lim_{x\to -\infty} \frac{2-3x+\pi x^3}{\sqrt{2}+3x^4-7x} =$ _____

   (c) $\lim_{x\to -\infty} \frac{4x^2+9x^3}{5-3x^3} =$ _____ (d) $\lim_{x\to -\infty} \frac{2+3x-7x^7}{4-3x^2+x^4} =$ _____

   (e) $\lim_{x\to -1^+} \frac{x^2-4x}{x^2-3x-4} =$ _____ (f) $\lim_{h\to 0} \frac{\frac{1}{(x+h)^2}-\frac{1}{x^2}}{h} =$ _____

   (g) $\lim_{t\to \infty} \frac{(2t^2+1)^2}{(t+1)^2(3t^2+t)} =$ _____ (h) $\lim_{x\to 3^-} \frac{9-x^2}{x-3} =$ _____

2. Suppose $f(x) = 2 - x - x^2$. Find $\lim_{h\to 0} \frac{f(2+h)-f(2)}{h} =$ _____

Bonus:

1. With an equation, define what it means for $f(x)$ to be continuous at a point $(a, f(a))$.

   _____

2. Define $f'(x) =$ _____ (provided it exists)

3. In terms of derivatives, describe the following:

   (a) $f(x)$ is increasing: _____

   (b) $f(x)$ is concave down: _____