In-class Activity 2

Last Name: _____ First Name: _____

Question 1 Compute the following limits:

(1) $\lim_{t\to 0} \dfrac{\sin(10t)}{t} =$

(2) $\lim_{h\to 0} \dfrac{2h}{\sin(5h)} =$

(3) $\lim_{x\to 0} \dfrac{x^2}{\sin(x)} =$

Question 2 Compute the following limits, specifying if they result in $-\infty$ or $+\infty$:

(1) $\lim_{x\to 2^-} \dfrac{4}{x-2} =$

(2) $\lim_{u\to 3^+} \dfrac{u-1}{3-u} =$

(3) $\lim_{x\to 0^+} \dfrac{\cos(x)}{x} =$

Question 3 Compute the following limits. Interpret your answer geometrically in terms of asymptotes.

(1) $\lim_{x\to-\infty} \dfrac{3x^4 - x^5}{x + x^5} =$

(2) $\lim_{t\to-\infty} \dfrac{2t}{t^2 - 1} =$

(3) $\lim_{x\to\infty} \dfrac{x^{10}}{x^2 - 3x^5} =$

Question 4 Compute the following limits, if they exist, or write "Does not exist" and justify why. Quote any Theorems or Results you are using:

(1) $\lim_{x\to0} x^6 \sin\left(\dfrac{6}{x}\right) =$

(2) $\lim_{x\to\infty} \dfrac{\cos(x)}{x} =$

(3) $\lim_{x\to0} \dfrac{2}{x} \sin(6x) =$

Question 5 Find all horizontal and vertical asymptotes for the function $f(x) = \dfrac{x^2 - 2x + 1}{x^2 - 1}$

Question 6 Give an example of a function f that has asymptotes $x = 0$, $y = 1$ and such that $f(0) = 5$.

Question * Compute the following limits if they exist, or write "Does not exist" and justify why:

(1) $\lim_{x\to 2} \dfrac{|x-2|}{x-2} =$

(2) $\lim_{u\to -3} \dfrac{u^2+6u+9}{|u+3|} =$

(3) $\lim_{x\to 0} \dfrac{|x|-x}{2x} =$