MATH 2554 **Calculus I** **Fall 2019**

Drill Handout Section 2.5 September 10, 2019 Name:_____

(1) Determine $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$ for the following function. Then give the horizontal asymptotes of f (if any).

$$f(x) = \frac{3x + \sqrt{4x^2+1}}{x+2}$$

(2) Determine $\lim_{x\to\infty} g(x)$ and $\lim_{x\to-\infty} g(x)$ for the following function. Then give the horizontal asymptotes of g (if any).

$$g(x) = 2x - \sqrt{4x^2+x+1}$$

(3) Determine $\lim_{x\to\infty} h(x)$ and $\lim_{x\to-\infty} h(x)$ for the following function. Then give the horizontal asymptotes of h (if any).

$$h(x) = e^{-x}\cos x$$

(4) Sketch a possible graph of a function f that satisfies all of the given conditions. Be sure to identify all vertical and horizontal asymptotes.

$$\lim_{x\to3} f(x) = \infty,\ \lim_{x\to1^+} f(x) = -\infty,\ \lim_{x\to1^-} f(x) = \infty, f(2) = 0$$

$$\lim_{x\to\infty} f(x) = 1,\ \lim_{x\to-\infty} f(x) = 2.$$