Quiz 1   MAC-2311   Spring 2017   **Name:** _____

To receive credit you MUST SHOW ALL YOUR WORK.

1. (7 pts) Compute each of the following limits. If the limit does not exist or is infinite, specify so.

(a) $\displaystyle\lim_{x\to-1} \frac{2x^2 + 5x + 3}{x^3 + x^2}$

(b) $\displaystyle\lim_{x\to-\infty} \frac{2x^2 + 5x + 3}{x^3 + x^2}$

(c) List all asymptotes (vertical and horizontal) for $f(x) = \dfrac{2x^2 + 5x + 3}{x^3 + x^2}$.

Briefly justify. Note that in parts (a) and (b), you computed some limits of this function.

2. (4 pts) Sketch the graph of a function $f(x)$ satisfying **all** of the following conditions.

(i) The function is **not** defined at $x = 0$ and $x = 3$,
but is defined for all other real numbers x;

(ii) $\displaystyle\lim_{x\to0} f(x) = 5$;

(iii) $\displaystyle\lim_{x\to3^-} f(x) = +\infty$, $\displaystyle\lim_{x\to3^+} f(x) = -\infty$;

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