Quiz #4, 9/17Math 156 (Calculus I), Fall 2024

Problem 1 is worth 5 points and Problem 2 is worth 5 points, for a total of 10 points. Remember to show your work on all problems!

1. For each of the following limits: compute the limit, or if it does not exist explain why.

(a)
$$\lim_{x \to 3} \frac{x^2 + 3}{x}$$

(b)
$$\lim_{x \to 1} \frac{x^2 + x - 2}{x - 1}$$

(c)
$$\lim_{x \to 2} \frac{1}{x - 2}$$

(d)
$$\lim_{x \to 0} f(x), \text{ where } f(x) = \begin{cases} x^2 + 1 & \text{if } x \ge 0\\ x^2 - 1 & \text{if } x < 0 \end{cases}$$

2. For each of the following limits: compute the limit, or if it does not exist explain why.

(a)
$$\lim_{x \to \infty} \frac{2x^2 + 2x - 1}{4x^2 - x + 4}$$

(b) $\lim_{x \to \infty} \frac{x^3 + 1}{5x^2}$
(c) $\lim_{x \to 0} \ln(\cos(x))$
(d) $\lim_{x \to 0} e^{(\frac{x^2 + x}{x})}$