Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

1. (*0 points*) Find the following limits:

(a) $\lim\limits_{x \to 0} \dfrac{\sin(4y)}{7y}$

(b) $\lim\limits_{x \to \infty} \dfrac{x^2 + 8}{6x^2 - x}$

(c) $\lim\limits_{x \to \infty} \dfrac{5x^3 + 7x - 8}{-4x^2 - 2x + 1}$

(d) $\lim\limits_{x \to \infty} \dfrac{x^2 - 5x - 9}{2x^4 + 3x^3}$

(e) $\lim\limits_{t \to 2^-} \dfrac{t + 2}{t - 2}$

2. (*0 points*) Find $\lim \dfrac{1}{x^2 - 4}$ as

(a) $x \to 2^+$

(b) $x \to 2^-$

(c) $x \to -2^+$

(d) $x \to -2^-$

3. (*0 points*) It can be shown that the inequalities

$$1 - \frac{x^2}{6} < \frac{x \sin x}{2 - 2\cos x} < 1$$

hold for all values of x close to zero. What, if anything, does this tell you about

$$\lim_{x \to 0} \frac{x \sin x}{2 - 2\cos x}?$$

Give reasons for your answer.

4. (*0 points*) Use the squeeze theorem to find $\lim\limits_{x \to \infty} \dfrac{\sin 3x}{x}$.

5. (*0 points*) Is the following function continuous at $x = 0$?

$$f(x) = \begin{cases} \dfrac{x-6}{x-3} & x < 0 \\ 2 & x = 0 \\ \sqrt{4 + x^2} & x > 0 \end{cases}$$