NAME: Solutions

Quiz Time: 10 minutes

Instructions: This quiz will be graded for accuracy, out of 10 points. Calculators, books, notes and suchlike aides to gracious living are not permitted. Make sure to show all your work for full credit.

1. Compute the limit:

\[
\lim_{x \to 3^-} \frac{9}{(x-3)(x+3)} - \frac{(x+3)}{(x-3)(x+3)} = \lim_{x \to 3^-} \frac{9 - x - 3}{(x-3)(x+3)}
\]

\[
= \lim_{x \to 3^-} \frac{6 - x}{(x-3)(x+3)} \leq \frac{3}{0^-} = -\infty
\]

2. Show that \( \lim_{x \to 0} x^6 \cos \left( \frac{x^7}{x^9 - 6x^3} \right) = 0. \)

\[-1 \leq \cos(x) \leq 1\]

\[-1 \leq \cos \left( \frac{x^7}{x^9 - 6x^3} \right) \leq 1\]

\[-x^6 \leq x^6 \cos \left( \frac{x^7}{x^9 - 6x^3} \right) \leq x^6\]

\[
\lim_{x \to 0} -x^6 = 0 \quad \lim_{x \to 0} x^6 = 0
\]

So by Squeeze Thm

\[
\lim_{x \to 0} x^6 \cos \left( \frac{x^7}{x^9 - 6x^3} \right) = 0
\]