MATH 170 – Section 008 – Quiz 2

You may work with other class members on this quiz, but you may not receive assistance from people not in MATH 170 (Section 008). You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or YOU WILL GET A ‘ZERO’ ON THE QUIZ. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by Monday, 31 January 2005 at 1540. GOOD LUCK!

1) Does \( \lim_{x \to 2} \frac{x^2 - 4}{|x - 2|} \) exist? If yes, evaluate the limit. If no, explain why not.

2) Prove: \( \lim_{x \to 0} \left( x^2 \cos^3 \left( \frac{1}{x} \right) \right) = 0 \)

3) Let \( f(x) = x^{-2} \). Find the largest value of \( \delta \) such that the condition

\[
0 < |x - 2| < \delta
\]

guarantees that

\[
\left| f(x) - \frac{1}{4} \right| < \frac{1}{10}.
\]

You may use decimal approximations to assist you, but give an exact answer.

4) Prove: \( \lim_{x \to 2} (2 - 3x) = -4 \) using the “precise” definition of limit.

5) Prove: \( \lim_{x \to 0} x^{-4} = \infty \) using the “precise” definition of limit.