

# Calculus 1 (201-NYA-05 C3)

## Quiz 3

September 13, 2008

Name:

Student Number:

Remember to clearly show all work and indicate your final answers. Part marks may be given for method but answers alone will not receive full marks. Notes are not allowed. You may use a non-programmable calculator.

1. (10 points) Evaluate the following limits. Remember to use correct notation.

$$\text{a) } \lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x^2 - 9} = \frac{0}{0}$$

$$= \lim_{x \rightarrow -3} \frac{(x+3)(x-2)}{(x+3)(x-3)} = \lim_{x \rightarrow -3} \frac{x-2}{x-3}$$

$$= \frac{-3-2}{-3-3} = \frac{-5}{-6} = \frac{5}{6}$$

$$b) \lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x} = \frac{0}{0}$$

$$= \lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x} \cdot \frac{\sqrt{2+x} + \sqrt{2}}{\sqrt{2+x} + \sqrt{2}}$$

$$= \lim_{x \rightarrow 0} \frac{\sqrt{2+x} \cdot \sqrt{2+x} - \sqrt{2} \sqrt{2+x} + \sqrt{2} \sqrt{2+x} - \sqrt{2} \sqrt{2}}{x(\sqrt{2+x} + \sqrt{2})}$$

$$= \lim_{x \rightarrow 0} \frac{(2+x) - 2}{x(\sqrt{2+x} + \sqrt{2})}$$

$$= \lim_{x \rightarrow 0} \frac{x}{x(\sqrt{2+x} + \sqrt{2})} = \lim_{x \rightarrow 0} \frac{1}{\sqrt{2+x} + \sqrt{2}}$$

$$= \frac{1}{\sqrt{2+0} + \sqrt{2}} = \frac{1}{2\sqrt{2}}$$