

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 3

Question 1. (10 marks) Evaluate the following limits:

$$\begin{aligned}
 \text{(a) } \lim_{x \rightarrow 1} \frac{x-1}{x^3+x^2-2x} & \stackrel{\text{i.f. } \frac{0}{0}}{=} \lim_{x \rightarrow 1} \frac{x-1}{x(x^2+x-2)} \\
 & = \lim_{x \rightarrow 1} \frac{\cancel{x-1}}{x(x+2)(\cancel{x-1})} = \lim_{x \rightarrow 1} \frac{1}{x(x+2)} \\
 & = \frac{1}{1(1+2)} = \frac{1}{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } \lim_{x \rightarrow 2} \sqrt{\frac{2x^3+4}{x^2+1}} & = \sqrt{\lim_{x \rightarrow 2} \frac{2x^3+4}{x^2+1}} = \sqrt{\frac{2(2)^3+4}{2^2+1}} \\
 & = \sqrt{\frac{16+4}{5}} = \sqrt{\frac{20}{5}} = \sqrt{4} = 2
 \end{aligned}$$