

WRITE YOUR NAME:

MAC 2241 Quiz 3
Wednesday March 22nd

Question 1. Evaluate the limit.

$$\begin{aligned} & \lim_{h \rightarrow 0} \frac{\sqrt{1+h} - 1}{h} \\ &= \lim_{h \rightarrow 0} \frac{\sqrt{1+h} - 1}{h} \cdot \frac{\sqrt{1+h} + 1}{\sqrt{1+h} + 1} \\ &= \lim_{h \rightarrow 0} \frac{(\sqrt{1+h})^2 - 1^2}{h(\sqrt{1+h} + 1)} = \lim_{h \rightarrow 0} \frac{1+h - 1}{h(\sqrt{1+h} + 1)} \\ &= \lim_{h \rightarrow 0} \frac{h}{h(\sqrt{1+h} + 1)} = \lim_{h \rightarrow 0} \frac{1}{\sqrt{1+h} + 1} \\ &= \frac{1}{\sqrt{1+0} + 1} = \frac{1}{\sqrt{1} + 1} = \frac{1}{1+1} = \frac{1}{2} \end{aligned}$$