

1. (12 points) Compute the following limits.

$$(i) \lim_{x \rightarrow 0} \frac{\sqrt{x+4} - 2}{x} \frac{(\sqrt{x+4} + 2)}{(\sqrt{x+4} + 2)} = \lim_{x \rightarrow 0} \frac{1}{\sqrt{x+4} + 2} = \frac{1}{4}$$

$$(ii) \lim_{x \rightarrow \infty} \frac{x - x^2}{3x^2 + 2} = -\frac{1}{3}$$

$$(iii) \lim_{x \rightarrow \pi} \frac{\sin x}{x} = \frac{\sin \pi}{\pi} = 0$$

$$(iv) \lim_{x \rightarrow \infty} \tan^{-1} x = \frac{\pi}{2}$$