

Find the following limits. Be sure to explain your reasoning at every step.

$$a) \lim_{x \rightarrow \infty} \frac{x + \sin x}{5x + 6}$$

$$b) \lim_{x \rightarrow \infty} \frac{\sin x}{x}$$

$$c) \lim_{x \rightarrow \infty} x \sin \frac{1}{x}$$

$$d) \lim_{x \rightarrow \infty} \frac{x \sin x}{x^2 + 5}$$

$$e) \lim_{x \rightarrow \infty} \sqrt{x^2 + x} - x$$

$$f) \lim_{x \rightarrow \infty} \frac{x^2(1 + \sin^2 x)}{(x + \sin x)^2}$$