

Section 3 Quiz

Evaluate the following limits.

1.) $\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x^2}$.

Solution:

$$\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x^2} = \lim_{x \rightarrow 0} \frac{\frac{d}{dx}(1 - \cos(x))}{\frac{d}{dx}x^2} = \lim_{x \rightarrow 0} \frac{\sin(x)}{2x} = \lim_{x \rightarrow 0} \frac{\frac{d}{dx} \sin(x)}{\frac{d}{dx} 2x} = \lim_{x \rightarrow 0} \frac{\cos(x)}{2} = \frac{1}{2}$$

2.) $\lim_{x \rightarrow \infty} \frac{e^{-x}}{\ln(x)}$

Solution:

Notice that if you take this limit you get $\frac{0}{\infty} = 0$.