1. Let \( s(t) = t \cos(t) \) be the position function for a moving ball. Find the average velocity of the ball during the time interval \([\pi/4, 3\pi/4]\).

2. Find the limit

\[
\lim_{x \to 0^+} \sin(\pi/x)
\]

or prove that it does not exist.
3. True/False:

• (a) By definition, the instantaneous velocity of an object equals a difference quotient.

• (b) If a car travels 80 miles between 2 and 4 pm, then its velocity has to be close to 40 mph at 2 pm.

• (c) If \( \lim_{h \to 0} f(h) = L \), then \( f(0.0001) \) is closer to \( L \) than is \( f(0.01) \).

• (d) The slope of the tangent line at any point on a straight line is constant.

• (e) If \( f(a) \neq g(a) \) then \( \lim_{x \to a} f(x) \neq \lim_{x \to a} g(x) \).