Also do the following.

**Problem 1.** Show that
\[
\lim_{x \to 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}.
\]
(HINT: Mimic the calculation of \(\lim_{x \to 0} \frac{1 - \cos x}{x^2}\) in §3.4.1.)

**Problem 2.** Let \(f(x) := \frac{1}{\sqrt{x}}\) for \(x > 0\). Use the formal definition of the derivative to compute \(f'(x)\).