1. Find the specified derivatives (DO NOT SIMPLIFY):
   (a) find \( f'(x) \) for \( f(x) = 12 \sec^3(x + 1) \)

   (b) find \( g'(t) \) for \( g(t) = \frac{t \cos(t^3)}{\sin(t) + 1} \)

   (c) find \( h'(\theta) \) for \( h(\theta) = \tan(4\theta)(\sec(2\theta) + \csc(\theta))^2 \)

   (d) find \( f'(0) \) for \( f(x) = x \tan(x) + \sin(3x) \)

2. A straight wire 60 inches long is bent by a right angle into the shape of an “L”. What is the length of the two “legs” of the “L” so that the triangle formed by adding a third side has maximal area.
3. Find the shortest possible distance from the point $P(0, 1)$ to the parabola $y = \frac{1}{2}x^2 - 4$.

4. Find the critical points and the absolute extrema for the function $f(x) = x(2 - x)^{2/3}$ on the interval $[0, 3]$. 