1. Solve and provide the answer in the simplest form:

\[
\frac{d}{dx} [\tan^{-1}(\cot x)] = 
\]

2. If \( g(x) = (f(x^3))^2 \) and \( f(8) = \frac{1}{4}, \ f'(8) = 2 \), then \( g'(2) = \)

3. If \( g(x) = \frac{h(x)}{x}, \ h(2) = 4, \ h'(2) = -3 \), then find slope of normal line to the curve \( g(x) \) at \( x = 2 \).

4.
A particle is moving along the hyperbola \( xy = 16 \). As it reaches the point \( (8, 2) \), the \( y \)-coordinate is decreasing at a rate of \( 3 \text{ cm/s} \). How fast is the \( x \)-coordinate of the point changing at that instant?