1. Evaluate \( \frac{d}{dx} \left( \int_{\sin(x)}^{\pi/2} \tan^{-1}(e^t + 4) \, dt \right) \).

2. Evaluate \( \int_{e^2}^{e^5} \frac{1}{x \ln(x)^2} \, dx \).
3. A particle moves in a straight line with velocity $v(t) = t^2 - 4t$.

(a) Find the displacement of the particle during the time interval $0 \leq t \leq 5$.

(b) Find the distance traveled by the particle during the time interval $0 \leq t \leq 5$. 