1. Evaluate the following integrals.
   a) (5 pt) \( \int_{2\pi}^{3\pi} x \sin(x) \, dx \).
   b) (5 pt) \( \int \tan^{-1}(ax) \, dx, a \neq 0 \).
   c) (5 pt) \( \int \cos(\ln(x)) \, dx \).

2. (5 pt) Find the volume obtained when the region bounded by \( f(x) = \sin(x) \), \( 2\pi \leq x \leq 3\pi \) is revolved about the \( y \)-axis.