1. Which of the following is correct? Justify your answer.
   A. \[ \int_{-1}^{3} x^{-2} \, dx = -x^{-1}\bigg|_{-1}^{3} = -\frac{4}{3} \]
   B. \[ \int_{1}^{5} x^{-2} \, dx = -x^{-1}\bigg|_{1}^{5} = \frac{4}{5} \]

2. If \( f(6) = 13 \), \( f' \) is continuous, and \( \int_{6}^{7} f'(x) \, dx = 16 \), what is the value of \( f(7) \)?

3. Find the integral.
   (a) \[ \int_{0}^{1} x^e + e^x \, dx \]
   (b) \[ \int_{0}^{1} \cosh t \, dt \]
   (c) \[ \int_{1/2}^{1/\sqrt{2}} \frac{4}{\sqrt{1-x^2}} \, dx \]

4. Find the derivative of \( \int_{2x}^{3x} \frac{u^2 - 1}{u^2 + 1} \, du \).

5. Show the following inequality.
   \[ 2 \leq \int_{-1}^{1} \sqrt{1 + x^2} \, dx \leq 2\sqrt{2} \]