Directions: Answer each question. Simplify. (6 points)

1. (3 points) Find the derivative of \( f(x) = \frac{x^2 - 2x + 7}{e^x} \).

Solution: \[ f'(x) = \frac{e^x (2x - 2) - (x^2 - 2x + 7) e^x}{(e^x)^2} = \frac{e^x ((2x - 2) - (x^2 - 2x + 7))}{e^{2x}} \]
\[ = \frac{e^x (2x - 2 - x^2 + 2x - 7)}{e^{2x}} = \frac{e^x (-x^2 + 4x - 9)}{e^{2x}} = \frac{-x^2 + 4x - 9}{e^x} \]

1. \( -x^2 + 4x - 9 \)

2. (3 points) \( \frac{d}{dx} [\csc(x)] = \)

2. \( -\csc(x) \cot(x) \)