1. Find the equation of the tangent line to the graph of \( f(x) = x^4 4^x \) at the point (1, 4).

2. Find the derivative of \( f(x) = \log_{15}(11x) \)

3. Find the indefinite integral: \( \int \frac{e^{3x}}{5+e^{3x}} \, dx \)

4. Find the indefinite integral: \( \int 2 \tan x \sec^2 x \, dx \)

5. Evaluate: \( \int_2^3 \frac{1}{x^2} \, dx \)
Given the following function: $f(x) = xe^{-x^2/2}$.

a) For what values of $x$ is $f$ increasing? Decreasing?

b) Find the $x$ coordinate of any points of inflection of the graph of $f$.

c) Find the average value of $f(x)$

d) Using the results found in parts (a), (b), and (c), sketch the graph of $f$ in the $xy$-plane provided below (Indicate all intercepts)