Homework 2 - due 10:00 AM on Wednesday, August 2

Derivatives Practice

Compute each of the following derivatives. Justify your answer.

1. $\dfrac{d}{dt}\dfrac{e^t}{e^t + t}$

2. $\dfrac{d^3}{dx^3}(9 - x)^8$

3. Find the partial derivatives for $g(x, y) = \dfrac{y^2}{(1 + x^2)^3}$.

4. Find the partial derivatives for $f(x, y) = \sin(x^2 y^5)$. **Hint**: You'll need to use the Chain Rule!

Integration Practice

Evaluate each of the following integrals. Make sure to justify your solution for each problem.

1. $\displaystyle\int \frac{dx}{1 + e^x}$

2. $\displaystyle\int \frac{dx}{x(x^4 + 1)}$

3. $\displaystyle\int \frac{e^x}{1 + e^x}\, dx$

4. $\displaystyle\int x(e^x)dx$