1. Compute the following derivatives:
   (a) \[ D \left( \arctan \frac{1 + x}{1 - x} \right) \]
   (b) \[ D \left( \ln \sqrt{1 + x^2} \right) \]

2. Compute the following integrals:
   (a) \[ \int xe^x \, dx \]
(b) \[ \int \frac{2x + 3}{(x - 2)(x + 5)} \, dx \]

3. Compute \( \lim_{x \to 0} \frac{x - \tan x}{x - \sin x} \).

4. State Taylor’s Theorem. (Don’t worry about all the assumptions on \( f \), but be sure to get the statement about \( E_n(x; a) \) correct.)

5. What old theorem is equivalent to the zeroth-order version of Taylor’s Theorem?

6. Based on your answer to Problem 1a, what can you say about the relationship between the functions \( \arctan \frac{x}{1-x^2} \) and \( \arctan x \)? (Hint: If this question seems vague or difficult, you might want to recheck your answer to Problem 1a!)

7. (Optional) What is conspicuously missing from this exam? (Hint: It was also missing from Problem Set 10.)