

Math 131 - Assignment 12

May 1, 2024

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. Use extra paper as necessary. This assignment is due May 8.

1. Let $F(x) = \int_x^{\pi/4} t \tan t \, dt$. Determine $F'(x)$.

2. Consider the function $F(x) = \int_2^x (t + t^2 + t^3) \, dt$.

(a) Evaluate $F(1)$.

(b) Find $F'(x)$ by evaluating the integral and then differentiating.

(c) Find $F'(x)$ by using the 2nd Fundamental Theorem of Calculus.

3. Use substitution to evaluate each definite integral.

(a) $\int_0^1 6x^2(x^3 + 12)^{118} dx$

(b) $\int_1^2 3x e^{x^2} dx$

4. Use substitution to evaluate each indefinite integral.

(a) $\int \frac{e^{1/x}}{x^2} dx$

(b) $\int \frac{x}{x^2 + 5} dx$