

Exercise 8

Use Part 1 of the Fundamental Theorem of Calculus to find the derivative of the function.

$$g(x) = \int_1^x \ln(1 + t^2) dt$$

Solution

According to part 1 of the fundamental theorem of calculus,

$$\frac{d}{dx} \int_a^x f(t) dt = f(x).$$

As a result,

$$g'(x) = \frac{d}{dx} \int_1^x \ln(1 + t^2) dt = \ln(1 + x^2).$$