Exercise 7

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

$$g(x) = \int_0^x \sqrt{t + t^3}\, dt$$

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,

$$g'(x) = \frac{d}{dx} \int_0^x \sqrt{t + t^3}\, dt = \sqrt{x + x^3}.$$