Exercise 9

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

$$g(s) = \int_5^s (t - t^2)^8 \, dt$$

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,

$$g'(s) = \frac{d}{ds} \int_5^s (t - t^2)^8 \, dt = (s - s^2)^8.$$