

We noted that Part 1 can be rewritten as

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

which says that if  $f$  is integrated and then the result is differentiated, we arrive back at the original function  $f$ . Since  $F'(x) = f(x)$ , Part 2 can be rewritten as

$$\int_a^b F'(x) dx = F(b) - F(a)$$

This version says that if we take a function  $F$ , first differentiate it, and then integrate the result, we arrive back at the original function  $F$ , but in the form  $F(b) - F(a)$ . Taken together, the two parts of the Fundamental Theorem of Calculus say that differentiation

$F(x^2) - F(0)$

11.  $h(x) = \int_{-2}^{1/x} \arctan t \, dt$

12.  $h(x) = \int_0^{x^2} \sqrt{1+r^3} \, dr$

47-50 □ Find the derivative of the function.