90. $F(x) = \int_2^{x^2} \frac{1}{2t^3} dt$

$$\frac{d}{dx} F(x) = \frac{d}{dx}\left(\int_2^{x^2} \frac{1}{2t^3} dt \right) = \frac{1}{2(x^2)^3} \frac{dx^2}{dx} - 0 = \frac{1}{x^5}$$