

**10.** Consider  $F(x) = [f(x)]^2 \Rightarrow F'(x) = 2f(x)f'(x)$ . So,

$$\begin{aligned}\int_a^b f(x) f'(x) dx &= \int_a^b \frac{1}{2} F'(x) dx \\ &= \left[ \frac{1}{2} F(x) \right]_a^b \\ &= \frac{1}{2} [F(b) - F(a)] \\ &= \frac{1}{2} [f(b)^2 - f(a)^2].\end{aligned}$$