

Use the Fundamental Theorem of Calculus to evaluate each expression.

1. $\frac{d}{dx} \int_2^x \sin^2 t \cos t \, dt$

2. $\frac{d}{dx} \int_0^x e^t \cos t^2 \, dt$

3. $\frac{d}{dx} \int_2^{x^2} t^2 - e^{2t} \, dt$

4. $\frac{d}{dx} \int_1^{\sin x} t^3 \cos t \, dt$

5. $\frac{d}{dx} \int_x^{x^2} t^3 - t^2 \, dt$

6. $\frac{d}{dx} \int_x^7 \cos(2t) - t \, dt$

7. $\frac{d}{dx} \int_{x^3}^3 3^t - \sin t \, dt$

8. $\frac{d}{dx} \int_{2x}^{3x^2} \tan t \, dt$

9. $\frac{d}{dx} \int_{x^2}^{e^x} e^{t^2} \, dt$