

1. Find the derivative of  $g(x) = \int_0^x \frac{t^2}{\sqrt{1+t^2}} dt$

2. Find the derivative of  $g(x) = \int_0^{\sin(x)} \frac{t^2}{\sqrt{1+t^2}} dt$

3. Compute  $\int_2^5 (3x^2 + 2x - 1) dx$

4. Compute  $\int_0^{\pi} \cos(x) dx$