

MAT 136 (Calculus I) Prof. Swift
In-class worksheet: The Fundamental Theorem of Calculus, Part II

1. Find a simple formula for $f(x) = \int_1^x t^3 dt$

2. Evaluate $f(1)$ and $f'(x)$ for the function f you found in problem 1.

3. Let $g(x) = \int_2^x \sin(t^2) dt$. Evaluate $g(2)$ and $g'(x)$.

Hint: Do not attempt to find a simple formula for $g(x)$, like you did in problem 1.

4. Let $h(x) = \int_2^{x^2} \sin(t^2) dt$. Evaluate $h(\sqrt{2})$ and $h'(x)$.

Hint: $h(x) = g(x^2)$.