Calculus I
Homework
The Fundamental Theorem of Calculus, Part I

1. Differentiate $f(x)$ using the Fundamental Theorem of Calculus part 1.

   (a) $f(x) = \int_1^x \sin\left(t^2\right) \mathrm{d}t$

   (b) $f(x) = \int_1^x \left(t - \sqrt{t}\right) \mathrm{d}t.$

   (c) $f(x) = \int_x^1 (2 + t^4)^5 \ \mathrm{d}t$

   (d) $f(x) = \int_0^{x^2} t^2 \mathrm{d}t.$

   (e) $f(x) = \int_{\ln x}^{e^x} t^3 \mathrm{d}t.$

   (f) $f(x) = \int_1^x \left(\sqrt{t} - \sqrt[3]{t}\right) \mathrm{d}t.$

   (g) $f(x) = \int_1^{\frac{1}{x+1}} \sin\left(t^2\right) \mathrm{d}t.$

   (h) $f(x) = \int_1^{\frac{1}{x+1}} \cos\left(t^2\right) \mathrm{d}t.$

   (i) $f(x) = \int_0^{x^3} \cos^2 t \ \mathrm{d}t$