

Calculus I

Homework The Fundamental Theorem of Calculus

Lecture 23

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

(a) $f(x) = \int_1^x \sin(t^2) \, dt$

(b) $f(x) = \int_1^x (t - \sqrt{t}) \, dt.$

(c) $f(x) = \int_x^1 (2 + t^4)^5 \, dt$

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

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

(f) $f(x) = \int_1^x (\sqrt{t} - \sqrt[3]{t}) \, dt.$

(g) $f(x) = \int_1^{\frac{1}{x+1}} \sin(t^2) \, dt.$

(h) $f(x) = \int_1^{\frac{1}{x+1}} \cos(t^2) \, dt.$

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