

Homework 23

1. Write down the second fundamental theorem of calculus. In your own words, write what this means and why this one is also such a big deal for Calculus.
2. Use the second fundamental theorem of calculus to find the following derivatives:

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

(b) $f(x) = \int_{-x}^{x^2} 3t^2 - 4\sqrt{t^2 - 7t} \, dt$

(c) $\int_{\sqrt{x}}^5 \frac{3t^2 - 3^t \ln t}{\sin t + \tan t} \, dt$

(d) $\int_{3x}^{4x^2} \frac{3x + 4^x}{\sec^2 x^2} \, dt$