

1. Find the derivative of each function.

(a) $f(x) = \int_2^x \sec^2 t \, dt$ $f'(x) = \sec^2 x$ (Use the Fundamental Theorem of Calculus Part 1)

(b) $h(x) = \int_1^{x^3} \tan t \, dt$ $h'(x) = 3x^2 \tan x^3$ (Use Chain Rule and FTC1)

2. Find each indefinite integral.

(a) $\int \frac{1}{\sqrt{x}} dx = \int x^{-1/2} dx = \frac{x^{1/2}}{1/2} + C = 2\sqrt{x} + C$

(b) $\int \frac{1}{x} dx = \ln |x| + C$

(c) $\int \csc^2 x \, dx = -\cot x + C$

(d) $\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x + C$

(e) $\int \sec x \tan x \, dx = \sec x + C$

3. Find each definite integral. (Simplify your answer.)

(a) $\int_0^1 e^x dx = [e^x]_0^1 = e^1 - e^0 = e - 1$

(b) $\int_1^2 (1+x) dx = \left[x + \frac{x^2}{2} \right]_1^2 = (2+2) - (1+\frac{1}{2}) = \frac{5}{2}$

(c) $\int_{\pi/6}^{\pi/4} \sin x \, dx = [-\cos x]_{\pi/6}^{\pi/4} = (-\cos \frac{\pi}{4}) - (-\cos \frac{\pi}{6}) = -\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} = \frac{\sqrt{3} - \sqrt{2}}{2}$

Extra credit problems - due Monday, July 2, 2001:

- Section 4.10: 1-15(odd) p.356
- Section 5.3: 5-37 (odd) p.398
- Section 5.4: 5-13 (odd), 17-39 (odd) p.407