

Mr. C. Sdoutz

Unit 5: Logarithmic & Exponential Functions
5.3 The Natural Exponential Function

The natural exponential function $y = e^x$ is extremely unique in calculus because it is its own derivative and its own anti-derivative.

ie.

$$\frac{d}{dx} [e^x] = \quad \text{and} \quad \int e^x dx =$$

ex. Differentiate each function:

a) $f(x) = e^{x^2}$

b) $f(x) = \frac{1}{e^{2x}}$

ex. Solve: *for integrals let u = the exponent function (inside of composite)

a)

$$\int e^{3x} dx$$

b)

$$\int \sin x e^{\cos x} dx$$

ex. Solve:

a)

$$\int_0^1 e^{-x} dx$$

b)

$$\int_0^1 \frac{e^x}{e^x + 1} dx$$

Practice Questions

Pg. 344/ #27 – 39, 43 – 52, 58, 59, 76 – 83, 87, 88, 92, 99, 101, 102



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