TOPIC: INTEGRALS INVOLVING LOGARITHMIC FUNCTIONS

Integrals Resulting in Natural Logs

◆ The *derivative* of $\ln x$ is **Recall** $\frac{d}{dx}\ln x = \frac{1}{x}, x > 0$ & we can _____ this rule to find the *integral* of $\frac{1}{x}$.

New **The Integral Resulting in Natural Log**

$$\int \frac{1}{x}\,dx = \_\_\_\_\_ + C$$

$$\int \frac{5}{x}\,dx =$$

◆ Remember, we can use the power rule to find the integral of x^{-n} when $n \neq 1$.

EXAMPLE Find the indefinite integral.

$$\int \left(\frac{1}{x^2} + \frac{3}{x}\right) dx$$

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EXAMPLE Find the indefinite integral.

$$\int \frac{x^3 e^x - 4x^2}{x^3}\,dx$$

Recall

$$\int \frac{1}{x}\,dx = \ln|x| + C$$

PRACTICE Find the indefinite integral.

$$\int \frac{3 - y^2}{2y}\,dy$$