7/21/08

$e^{\ln(2x)} = 12$

$2x = 12$

$\boxed{x = 6}$

$\frac{\ln 14}{\ln 3} \approx 2.4$

$\ln\left(\frac{14}{3}\right) \approx 1.54$

$\ln 14 - \ln 3 \approx 1.54$

The ratio of 2 logs of the same IS NOT EQUAL TO the log of a ratio

$\ln_e 4x = 1 \iff e^1 = 4x$

logarithm — is an — exponent

$x = \frac{e}{4} \approx 0.680$

example: $f(x) = e^{\sqrt{x}}$

$$f'(x) = e^{\sqrt{x}} \frac{d}{dx}\sqrt{x}$$

$$= e^{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}}$$

$$= \boxed{\frac{e^{\sqrt{x}}}{2\sqrt{x}}}$$

example: $y = x^2 e^x$

$$y' = 2xe^x + x^2 e^x$$

$$\boxed{y' = xe^x(2+x)}$$

example: $h(t) = te^{t^2}$

$$h'(t) = 1e^{t^2} + te^{t^2} \cdot 2t$$

$$\boxed{h'(t) = e^{t^2}(1 + 2t^2)}$$

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example: $\int e^{4x}\,dx = \int e^{u}\,\frac{du}{4}$

$u = 4x$

$du = 4dx$

$dx = du/4$

$= \frac{1}{4}\int e^{u}\,du$

$= \frac{1}{4}e^{u} + C$

$$\boxed{\frac{1}{4}e^{4x} + C}$$

$$\int e^{\sin\left(\frac{x}{2}\right)} \cos\left(\frac{x}{2}\right) dx = \int e^{u} \cancel{\cos\tfrac{x}{2}} \frac{2\,du}{\cancel{\cos\tfrac{x}{2}}}$$

$u = \sin\frac{x}{2}$

$du = \frac{1}{2}\cos\frac{x}{2}\,dx$

$dx = \frac{2\,du}{\cos\frac{x}{2}}$

$= 2\int e^{u}\,du$

$= 2e^{u} + C$

$= \boxed{2e^{\sin\frac{x}{2}} + C}$