$$\frac{1}{3}\int 3x^2 \cos(x^3-3)\,dx$$

Let $u = x^3 - 3$

$du = 3x^2 \cdot dx$

$$\frac{1}{3}\int \cos u \, du$$

$$\frac{1}{3}\sin u + C$$

$$\frac{1}{3}\sin(x^3-3) + C$$

$$\int_0^{\frac{\pi}{4}} \tan x \sec^2 x \, dx$$

Let $u = \tan x$

$du = \sec^2 x \, dx$

$u = \tan 0$

$u = 0$

$u = \tan \frac{\pi}{4}$

$u = 1$

$$\int_0^1 u \, du$$

$$\left.\frac{u^2}{2}\right|_0^1 = \frac{1}{2}$$

$$\int u \, du$$

$$\frac{u^2}{2} + C$$

$$\left.\frac{\tan^2 x}{2} + C\right|_0^{\frac{\pi}{4}}$$

$$\frac{1}{2} + C - (0 + C)$$

$$\frac{1}{2}$$

$$\frac{dy}{dx} = (y+5)(x+2)$$

$$\int \frac{1}{y+5} \frac{dy}{dx} dx = \int x+2 \, dx$$

$$\int \frac{1}{y+5} dy = \int x+2 \, dx$$

$\log_a b = k$

$a^k = b$

$$\ln|y+5| = \frac{x^2}{2} + 2x + C$$

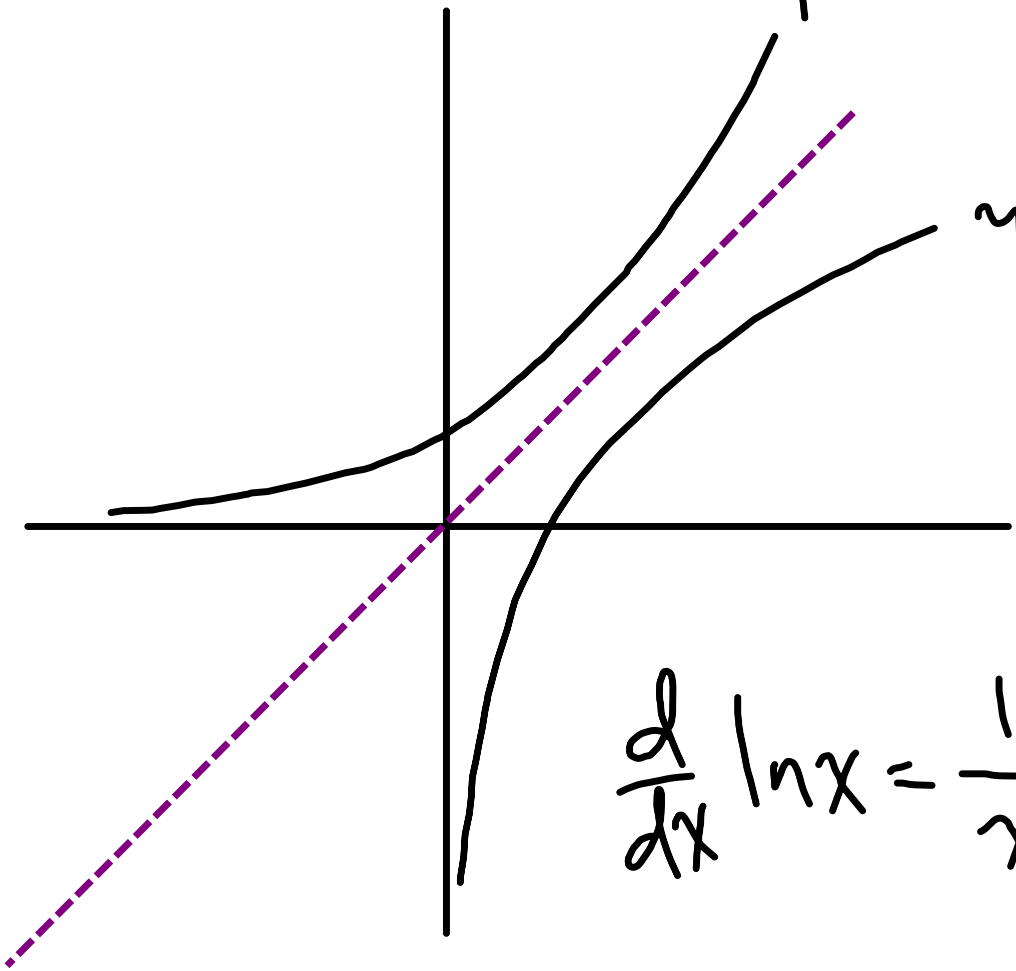
$$|y+5| = e^{\frac{x^2}{2}+2x+C}$$

$a^m a^n$

a^{m+n}

$$y = e^{\frac{x^2}{2}+2x+C} - 5$$

$$y = e^C \cdot e^{\frac{x^2}{2}+2x} - 5$$



$$\int \frac{1}{x}\,dx$$

$$\frac{d}{dx}\ln x = \frac{1}{x} \qquad \ln|x| + c$$

$$\frac{dy}{dx} = -2xy^2 \qquad y(1) = .25$$

$$\int \frac{1}{y^2}\,dy = -\int 2x\,dx$$

$$-y^{-1} + C_1 = -x^2 + C_2$$

$$y^{-1} = x^2 + C$$

$$\frac{1}{y} = x^2 + C$$

$$y = \frac{1}{x^2 + C}$$

General solution

$$.25 = \frac{1}{1 + C}$$

$$3 = C$$

The particular solution

$$y = \frac{1}{x^2 + 3}$$

Title: Mar 9-11:46 AM (5 of 5)