



**SECTIONS 7.2, 7.3 AND 7.4**

**INTEGRATION WITH LOGARITHMIC  
AND EXPONENTIAL FUNCTIONS**

How do you solve  $\int \frac{1}{x} dx$

Do you remember a function whose derivative is  $1/x$ ?  $\frac{d}{dx} [\ln x] = \frac{1}{x}$

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

The domain of  $1/x$  is  $(-\infty, 0) \cup (0, \infty)$ ,  
but the domain of  $\ln x$  is  $(0, \infty)$ .  
So we need to use absolute value.



## EXAMPLES

$$\int_{-4}^{-2} \frac{1}{x} dx$$


$$\int \frac{x}{x^2 + 1} dx$$



$$\int \tan x \, dx$$

$$\int \tan x \, dx = \ln|\sec x| + C$$

On Blue Sheets, memorize or not!



# EXPONENTIAL FUNCTIONS

$$\int e^x dx = e^x + C$$

$$\int e^{5x} dx$$



$$\int a^x dx = \frac{a^x}{\ln a} + C$$

$$\int_0^5 2^x dx$$

$$\int 3^{\sin \theta} \cos \theta d\theta$$



- Calculaugh 51/52
- P. 367 #67 – 81 odd, skip #77 for now...

