Integration of Exponential Functions

W-up: Differentiate each function:

A) $f(x)=e^{3x^2+1}$ B) $f(x)=5^{\ln x}$

Integrating base "*e*" exponentials

$$\int e^u \, du = e^u + C$$

When integrating exponentials, generally let *u* = the exponent **OR** the exponential expression in the denominator(especially when used as an expression in a binomial)

EX) $\int e^{3x+1}dx$ EX) $\int \frac{e^{x^{-1}}}{x^2}dx$ EX) $\int \frac{e^{2x}}{1+e^{2x}}dx$

Integrating NON- base "*e*" exponentials

$$\int b^u \, du = \frac{b^u}{\ln b} + C$$

EX) $\int 4^{-x}dx$ EX) $\int 2^{\sin x}\cos x \, dx$