B.5 - Day 4 - Natural Logs

The function $y = e^x$ has an inverse, the **natural logarithmic function**, $y = \log_e x$, or $y = \ln x$.

Same conversion rule:

$e^b = a$ <----------> $\ln a = b$

Don't overcomplicate this!!!

think of it as *log* base e!

Same properties:

Product: ln a + ln b = ln ab

Quotient: ln a - ln b = ln a/b

Power: p ln a = ln a^p

Feb 29-7:57 AM

2. What are the solutions of each equation?

a. $\ln_e x = 2$

$e^2 = x$

7.3891 ≈ x

b. $\ln 2x + \ln 3 = 5$

$\ln_e 6x = 5$

$e^5 = 6x$

$\frac{148.413159\ldots}{6} = \frac{6x}{6}$

24.7355 ≈ x

Feb 29-8:07 AM

3. What is the solution of $e^{x-2} = 12$?

Key Fact!!!
$\ln e = 1$

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

$x-2 \cdot \ln(e) = \ln(12)$

$x-2 = \ln(12)$

$+2 \quad +2$

$x \approx 4.4849$

Feb 29-8:12 AM

4. What is the solution of $4e^{2x} + 2 = 16$?

$-2 \quad -2$

$\frac{4e^{2x}}{4} = \frac{14}{4}$

$e^{2x} = 3.5$

$\ln(e)^{2x} = \ln(3.5)$

$2x \cdot \ln(e) = \ln(3.5)$

$\frac{2x}{2} = \frac{\ln(3.5)}{2}$

$x \approx 0.6264$

Feb 29-8:14 AM