8.6 Exponential Equations

std. 11.0

examples:

1 **Solve:** $16^{2x} = 64^{3x-2}$

$16^{2.4} = 64^{1.6}$

CK

$(4^2)^{2x} = (4^3)^{3x-2}$

$4x = 9x - 6$

$-5x = -6$

$x = 6/5$

1.2

2 **Evaluate:** $\log_4 15$

$4^x = 15$

$\log 4^x = \log 15$

$x \log 4 = \log 15$

$x = \frac{\log 15}{\log 4} \approx 1.95$

3 **Solve:** $8 + 6^{5x+4} = 35$

$8 + 6^{1.84} = 35$

-2.16

$6^{5x+4} = 27$

$\log 6^{(5x+4)} = \log 27$

$(5x+4)\log 6 = \log 27$

$5x+4 = \frac{\log 27}{\log 6}$

$-.43 \approx x = \left(\left(\frac{\log 27}{\log 6}\right) - 4\right) \div 5$

- $\ln e^x = x$

Proof: $\ln e^x$

$= \log_e e^x = ?$

$e^? = e^x \quad ? = x$

4 **Solve:** $40e^{0.6x} = 240$

2.99

$e^{0.6x} = 6$

$\ln e^{0.6x} = \ln 6$

$.6x = \ln 6$

$2.99 \approx x = \frac{\ln 6}{.6}$