8.6 Exponential Equations

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std. 13.0

examples:

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

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

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

$4x = 9x - 6$

$6/5 = x$

1.2

2 Evaluate: $\log_4 15$

$\log_4 15 = x$

$4^x = 15$

$\log 4^x = \log 15$

$x \log 4 = \log 15$

$1.953 \approx x = \dfrac{\log 15}{\log 4}$

3 Solve:

$8 + 6^{5x+4} = 35$

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

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

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

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

$x = \left(\dfrac{\log 27}{\log 6} - 4\right) \div 5$

$x \approx -.432$

- $\ln e^x = x$

$\ln e^4 = 4$

$\ln e^x = \log_e e^x = x$

$e^? = e^x$

$? = x$

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

$e^{0.6x} = 6$

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

$0.6x = \ln 6$

$2.986 \approx x = \dfrac{\ln 6}{.6}$