Math 41
Quiz 5
November 5, 2010

Solve the exponential equation for x in terms of logs, then round your answer to three decimal places.

1. $4e^{2x-1} - 1 = 11$

$4e^{2x-1} = 12$

$e^{2x-1} = 3$

$\ln e^{2x-1} = \ln 3$

$2x-1 = \ln 3$

$2x = 1 + \ln 3$

$x = \frac{1}{2}(1 + \ln 3)$

$x \approx 1.049$

2. $500e^{0.025x} = 30{,}000$

$e^{0.025x} = 60$

$\ln e^{0.025x} = \ln 60$

$0.025x = \ln 60$

$x = \frac{1}{0.025} \ln 60$

$x \approx 163.774$

3. $\dfrac{20}{1+2e^{-0.5x}} = 15$

$20 = 15(1 + 2e^{-0.5x})$

$\frac{4}{3} = 1 + 2e^{-0.0x}$

$\frac{1}{3} = 2e^{-0.5x}$

$\ln(1/3) =$

$\frac{1}{6} = e^{-0.5x}$

$\ln(1/6) = \ln e^{-0.5x}$

$\ln(1/6) = -0.5x$

$x = -\frac{1}{0.5} \ln(1/6)$

$x \approx 3.584$