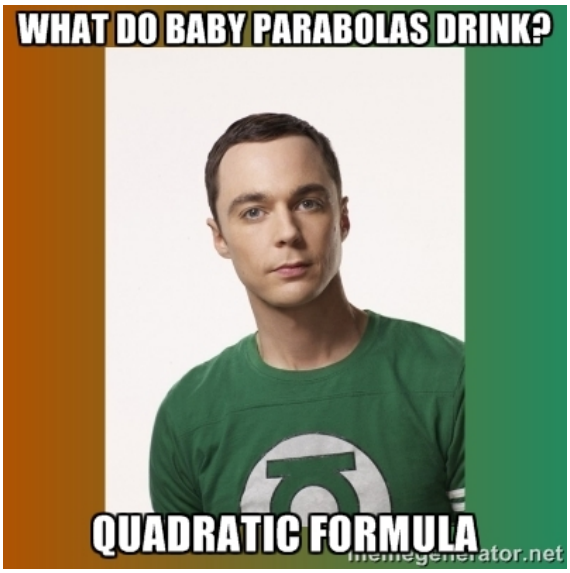
Monday, November 14, 2016 -

Late Start

3.5 - Solving Exponential & Log Equations

HW Questions



Quiz 3.3 - 3.5 on Wednesday!

3.5 Solving Continued

change to Log/ln form

① $\frac{25e^{.2x}}{25} = \frac{125}{25}$

$e^{.2x} = 5$

$\ln 5 = .2x$

$x = \frac{\ln 5}{.2} \approx 8.047$

② $18e^{-.7x} = 100$

$e^{-.7x} = \frac{100}{18}$

$x \approx -2.450$

③ $\frac{25}{(1+6e^{-.5x})} = 10$

$25 = 10 + 60e^{-.5x}$

$\frac{15}{60} = \frac{60e^{-.5x}}{60}$

$\frac{1}{4} = \frac{15}{60} = e^{-.5x}$

$\ln\frac{1}{4} = -.5x$

$x = \frac{\ln(\frac{1}{4})}{-.5} \approx \boxed{2.773}$

Change to Exponential Form

④ $\log_6(2y+8)=2$

$6^2=2y+8$

$36=2y+8$

$28=2y$

$\boxed{14=y}$

⑤ $\ln x^3=4$

$e^4=x^3$

$\sqrt[3]{e^4}=x$

$x\approx 3.794$

OR power Rule

$3\ln x=4$

$\ln x=\frac{4}{3}$

$e^{\frac{4}{3}}=x$

$x\approx 3.794$

Using Properties of Logs

⑥ $\log(x-16)+\log(x-1)=2$

product Rule

$\log(x-16)(x-1)=2$

$\log(x^2-17x+16)=2$

↙ change to exp. form

$10^2=x^2-17x+16$

$100=x^2-17x+16$

$0=x^2-17x-84$

$0=(x-21)(x+4)$

$x=21, \cancel{-4}$ Check for Extraneous Sol.

(makes log(-) negative)

⑦ $\log(3x-1)+\log x=\log 4$

Product Rule

$\cancel{\log}(3x-1)x=\cancel{\log}4$

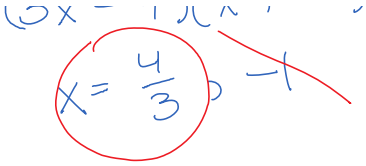
$(3x-1)x=4$

$3x^2-x=4$

$3x^2-x-4=0$

$(3x-4)(x+1)=0$

$x=\frac{4}{3}, \cancel{-1}$



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