Day 3

Chapter 3

Learning Target 5

I can solve exponential and logarithmic equations not requiring the one-to-one property.

Solve each logarithmic/exponential equation.

Round your answers to 4 decimal places.

Has one log/ln in the problem--rewrite in exponential

1.) $\ln(3x+4)+2=5$

$-2 \quad -2$

① Get log and argument alone

$\ln_e(3x+4)=3$

② Rewrite in exponent form

$3x+4=e^3$

$3x+4=20.0855$

$\frac{3x}{3}=\frac{16.0855}{3}$

$x=5.3618$

2.) $3\log_5(x^2+2x+1)-7=-1$

① Get log & argument alone

$\frac{3}{3}\log_5(x^2+2x+1)=\frac{6}{3}$

$\log_5(x^2+2x+1)=2$

② Change to exponent form

$x^2+2x+1=5^2$

$x^2+2x+1=25$

$x^2+2x-24=0$

$(x+6)(x-4)=0$

$x=-6, 4$

Has a base "e" -- rewrite as ln

3.) $-2e^{5x}+4=-36$

① Get base alone

$-2e^{5x}=-40$

$e^{5x}=20$

② ln both sides

$\ln e^{5x}=\ln 20$

$5x=\ln 20$

$5x=2.9957$

$x=.5991$

Has a base "number" -- ln or log both sides

4.) $-3+2^{2x+3}=14$

① Get base alone

$+3 \quad +3$

$2^{2x+3}=17$

② ln or log both sides

$\log 2^{2x+3} = \log 17$

$(2x+3)\log 2 = \log 17$

$\frac{(2x+3)\log 2}{\log 2} = \frac{\log 17}{\log 2}$

$2x+3 = 4.0874$

$2x = 1.0874$

$x = .5437$

5.) $\frac{3\cdot 2^{4x}}{3} = \frac{16}{3}$

$2^{4x} = 5.3$

$\frac{4x}{4} = \frac{2.40}{4}$

$4x \log 2 = \log 5.3$

$\frac{4x}{4} = \frac{\log 5.3}{\log 2}$

$x = .6014$