Functions/Regression – Exponential and Logarithmic Equations

Solving Exponential Equations Examples:

Notes: 1.) Keep answers as (reduced) fractions when possible.
If a decimal can NOT be turned into a fraction – ROUND to 3 decimal places

Exponential Equations: Type 1 – Both Sides have the Same Base

1a.) $2^{2x+14} = 64$	1b.) $4^{3x} = 32^{x+1}$	1c.) $3^{2x+5} = \left(\frac{1}{9}\right)^{x-1}$	1d.) $25 \cdot \left(\frac{1}{125}\right)^{x+4} = \sqrt{3125}$

Exponential Equations: Type 2: Both Sides are NOT the Same Base – Take log (or ln) of both sides

1e.) $3^{2x-1} = 7$	1f.) $3 \cdot 4^{x} + 11 = 2$	1g.) $2e^{5x-3} = 16$	1h.) $\frac{12}{1+e^{-x}} = 2$

Solving Logarithmic Equations Examples:

Notes: 1.) Keep answers as (reduced) fractions when possible – if not, ROUND to 3 places!

2.) Remember – You CAN NOT take log of a negative number or zero (b/c VA: x = 0)
Some solutions MAY OR MAY NOT WORK (could also have no solutions)!
When done solving a log equation – Check to see that it works in the original problem!

Logarithmic Equations: Type 1 – Both sides (and every term) is a logarithm

2a.) $\log_5(6-3x)=\log_5(10-5x)$	2b.) $\log(x-3)+\log x=\log 28$	2c.) $\ln(2x+1)-\ln(x-1)=\ln 7$

Logarithmic Equations: Type 2 – SINGLE LOG on one side and a CONSTANT on the other side

2d.) $\log_3(2x+15)=2$	2e.) $\log_2 x+\log_2(x-2)=3$	2f.) $4-6\ln(3x-1)=-20$