FST Name:
Notes 5.6 Date: Block:

5.6 Solving Exponential and Logarithmic Equations

Solving WITHOUT a calculator.

Like Bases (or Bases that can be made like)

Solve each exponential or logarithmic equation.

1) $7^{2x} = 7^{48}$

2) $25^{4x} = 125^{2x-1}$

3) $2^{x+3} = 8^{x-1}$

4) $log_2(x+6) = log_2(10x)$

5) $\log x + \log(x-4) = \log 45$

But… what happens if we cannot make the bases the same?

1) $8^x = 44$

2) $2 - 6^x = -9$

3) $8e^{2x} = 20$

4) $e^{x+7} = 10$

5) $3^{x+2} = 7$

6) $4^{2x-1} = 3^{x+5}$

7) $5^{x+4} = 3^{4x-3}$

When there is ONE Logarithm (or you can condense to get a single logarithm)

Examples)

1.) $\log_2(x+1)-2=5$

2) $6-\log(3x)=-2$

3.) $2\log(x)-\log(3)=2$

4) $\ln x+\ln 3=2$

5) $4+3\log(2x)=16$

Practice:

1) $2\ln(x+6)=-18$

2) $4^x=\left(\frac{1}{2}\right)^{x-3}$

3) $\log(2x)=2-\log(x-5)$

4) $\log_3(7x+1)-\log_3(x-2)=2$

5) $\log_4 2x+\log_4 3=\log_4 36-\log_4 2$

6) $2\ln x=\ln 2+\ln(3x-4)$

7) $6^{3x-4}=10^{2x}$

8) $9^{4x-1}=27^{2x+5}$

9) $5\ln(2x-1)=-25$

10) $\log_2(n^2+12)=\log_2(-9n-2)$