Topic: Expand and Condense Logarithms

Name: _____

Date: _____

What am I learning today?

_____

_____

Warm-Up

Solve the following equations. Round your answers to the nearest hundredth (2 decimal places)

1) $\log_2(2x-2)=3$

2) $-14+3e^x=11$

Properties of Logarithms

1) Product Property: $\log_b uv = \log_b u + \log_b v$
2) Quotient Property: $\log_b\left(\frac{u}{v}\right) = \log_b u - \log_b v$
3) Power Property: $\log_b u^n = n\log_b u$
4) Recall: $\sqrt{u} = u^{\frac{1}{2}}$

Examples:
Expanding
(go from one log to MANY)

Expand the following:

1) $\log_2(3x)$

2) $\log_3\left(\frac{x}{4}\right)$

3) $\log_5\left(\frac{x}{2y^4}\right)$

4) $\log_2\left(\sqrt{xy}\right)$

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You Try!

Expand the following

a: $\log\left(y^2\right)$

b: $\log_2\left(\frac{xy}{z}\right)$

c: $\log\left(\frac{\sqrt{x-3}}{y}\right)$

Examples:
Condensing
(go from many Logs to ONE)

Condense the following:

5) $\ln(4)+\ln(x)$

6) $3[\log(6)+\log(x)]-2\log(3)$

7) $2\log_4(x)-\log_4(7)$

You Try

Condense the following:

d: $4\log(x)$

e: $2\ln(4)-\ln(5)$

f: $[\log(x)+\log(y)]-2\log(z)$

Summary
Summarize the lesson in your own words