Warm-Up:

1) Write as a single logarithm:

a) $\log 2 + 3\log x$ $\log 2x^3$

b) $2\log_4 y - \log_4 x$ $\log_4 y^2 - \log_4 x = \log_4 \left(\frac{y^2}{x}\right)$

2) Expand:

a) $\log_2 x^5 y^2$ $= 5\log_2 x + 2\log_2 y$

b) $\log \frac{2x}{y^3}$ $= \log 2 + \log x - 3\log y$

ACT Question of the Day

18. In which of the following are $\frac{1}{2}$, $\frac{5}{6}$, and $\frac{5}{8}$ arranged in ascending order?

ascending – goes from least to greatest

F. $\frac{1}{2} < \frac{5}{8} < \frac{5}{6}$

G. $\frac{5}{6} < \frac{1}{2} < \frac{5}{8}$

H. $\frac{5}{6} < \frac{5}{8} < \frac{1}{2}$

J. $\frac{5}{8} < \frac{1}{2} < \frac{5}{6}$

K. $\frac{5}{8} < \frac{5}{6} < \frac{1}{2}$

$\frac{1}{2} = .5$

$\frac{5}{6} = .83$

$\frac{5}{8} = .625$

NC Final Exam Question of the Day

20 Which expression is equivalent to $\frac{x+7}{x^2+4x-21} \div \frac{x+5}{x^2+8x+15}$ when x is restricted so that the expressions are defined?

A $\frac{x+3}{x-3}$

B $\frac{x-3}{x+3}$

C 1

D -1

$\frac{x+7}{(x-3)(x+7)} \cdot \frac{(x+3)(x+5)}{x+5}$

-21: $-3, 7$ (4) $\quad 15$: $3, 5$ (8)

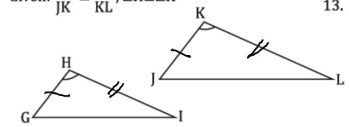
Review: Triangle Proofs

12. Given: $\frac{GH}{JK} = \frac{HI}{KL}$, $\angle H \cong \angle K$

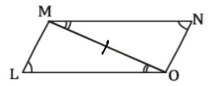
Prove: $\triangle GHI \sim \triangle JKL$

Statements	Reasons
1. $\frac{GH}{JK} = \frac{HI}{KL}$	1. given
2. $\angle H \cong \angle K$	2. Given
3. $\triangle GHI \sim \triangle JKL$	3. SAS

13.



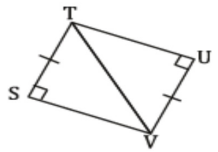
4. Given: $\angle L \cong \angle N$, $\angle LOM \cong \angle NMO$



Prove: $\triangle LMO \cong \triangle NOM$

Statements	Reasons
1. $\angle L \cong \angle N$	1. given
2. $\angle LOM \cong \angle NMO$	2. Given
3. $\overline{MO} \cong \overline{MO}$	3. Reflexive Property
4. $\triangle LMO \cong \triangle NOM$	4. AAS

6. Given: $\overline{ST} \cong \overline{VU}$



Prove: $\angle SVT \cong \angle UTV$

Statements	Reasons
1. $\overline{ST} \cong \overline{VU}$	1. Given
2. $\overline{TV} \cong \overline{TV}$	2. Reflexive Property
3. $\triangle SVT \cong \triangle UTV$	3. HL
4. $\angle SVT \cong \angle UTV$	4. CPCTC

Unit 6 ~ Logarithms & Exponentials

Objective: F.LE.4

log form $\log_b x = y$ exp form $b^y = x$

Day 4: Solving Exponential & Logarithmic Equations

logs are the inverse of exp.

Solving Exponential Equations:

Example 1: Solve $256^{2x} = 64$

$b=256 \quad x=64 \quad y=2x$

$\log_{256} 64 = 2x$

$\frac{\log 64}{\log 256} = 2x$

$\frac{.75}{2} = \frac{2x}{2}$

$x = .375$

Example 2: Solve $6^{4x} = 512$

$b=6 \quad x=512 \quad y=4x$

$\log_6 512 = 4x$

$\frac{\log 512}{\log 6} = 4x$

$\frac{3.48}{4} = \frac{4x}{4}$

$x = .87$

HINT: PUT IN LOG FORM!!

Your Turn:

Solve for x.

1) $27^{3x} = 81$

$b=27 \quad y=3x \quad x=81$

$\log_{27} 81 = 3x$

$\frac{\log 81}{\log 27} = 3x$

$\frac{1.3}{3} = \frac{3x}{3}$

$x = .44$

2) $5^{2x} = 130$

$b=5 \quad y=2x \quad x=130$

$\log_5 130 = 2x$

$\frac{\log 130}{\log 5} = 2x$

$\frac{3.02}{2} = \frac{2x}{2}$

$x = 1.51$

Solving Logarithmic Equations:

Example 1: Solve $\log(5x + 2) = 2$

If there is no base... your base is always 10

$b=10 \quad x=5x+2 \quad y=2$

$10^2 = 5x + 2$

$100 = 5x + 2$

$-2 \quad -2$

$98 = 5x$

$x = 19.6$

Hint: Put in exponential form!

Example 2: Solve $\log 2x^2 - \log 5 = 1$

expanded

condense: $\log \frac{2x^2}{5} = 1$

$b=10$

$x = \frac{2x^2}{5}$

$y=1$

$5 \cdot 10^1 = \frac{2x^2}{5} \cdot 5$

$\frac{50}{2} = \frac{2x^2}{2}$

$\sqrt{25} = \sqrt{x^2}$

$x = 5$