

**Algebra II Warm Up** 2-18-15

**Solve the system of inequalities and tell what quadrant(s) the solution is in.**

$4y - 3x \leq -8$   
 $2x + y < 6$

$y \leq -2x + 6$   
 $y \leq \frac{3}{4}x - 2$

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Today we will be learning Properties of Logarithms.

**Product Property**

$\log_b M \cdot N = \log_b M + \log_b N$

$\log_3 \frac{5x}{x} = \log_3 5 + \log_3 x$

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**Quotient Property**

$\log_b \frac{M}{N} = \log_b M - \log_b N$

$\log_2 \frac{x}{9} = \log_2 x - \log_2 9$

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**Power Property**

$\log_b M^n = n \log_b M$

$\log_4 x^2 = 2 \log_4 x$

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**Expand** ① Look x or y ② Exponents

1.  $\log_7 2x^4$     2.  $\log \frac{m^2 \cdot n^4}{t}$     3.  $\ln \sqrt{4r}$

$\log_7 2 + \log_7 x^4$      $\log m^2 + \log n^4 - \log t$      $\ln(4r)^{\frac{1}{2}}$

$\log_7 2 + 4\log_7 x$      $2\log m + 4\log n - \log t$      $\ln 4^{\frac{1}{2}} r^{\frac{1}{2}}$

$\sqrt[a]{p^i} = p^{\frac{i}{a}}$      $\frac{1}{2}\ln 4 + \frac{1}{2}\ln r$

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**Condense** ① Exponents ②  $\frac{+}{x}$  or  $\frac{-}{-}$

1.  $5\log x - 4\log y$     2.  $\ln 40 + 2\ln \frac{1}{2} + \ln x$

$\log x^5 - \log y^4$      $\ln 40 + \ln (\frac{1}{2})^2 + \ln x$

$\log \frac{x^5}{y^4}$      $\ln 40 \cdot (\frac{1}{2})^2 \cdot x$

$\ln 10x$

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3.  $5\log x + 3\log y - \log z$     4.  $\frac{1}{2}\log_3 9 + 3\log_3 r$

$\log x^5 + \log y^3 - \log z$

$\log \frac{x^5 y^3}{z}$

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**Properties**

$b^{\log_b x} = x$      $\log_b b^x = x$

$5^{\log_5 3x} = 3x$      $\log_2 2^{4y} = 4y$

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**Simplify**

1. <del><math>\log_3 3^{2m}</math></del> 2m	2. <del><math>5^{\log_5 27}</math></del> 27	3. <del><math>\log_{10} 10^{3x-8}</math></del> 3x-8
4. <del><math>8^{\log_8 4m}</math></del> 4m	5. <del><math>\ln e^{5k}</math></del> 5k	6. <del><math>10^{\log 288}</math></del> 288

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**Conclusion**

1. What is the product property? +
2. What is the quotient property? -
3. What is the power property? Exponent goes to front
4. Questions?????

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Day 9  
**Properties of Logarithms**  
**Wkst**

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