Algebra 2 7.4

Solve logarithmic equations

Solve logarithmic inequalities

domain

$x>0$

extraneous (solution)

argument

whiteboards

Quiz 7.3-7.4

eT

4) $\log_2(8x+5) > \log_2(9x-18)$

$8x+5 > 9x-18$

$-8x+18 \quad -8x+18$

$23 > x$

$x < 23$

$8x+5 > 0$

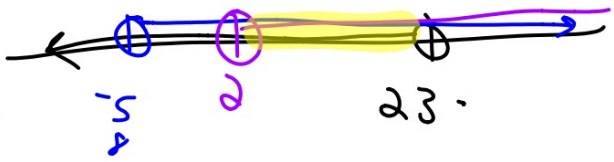
$\frac{8x}{8} > -\frac{5}{8}$ $\quad x > -.625$

$9x-18 > 0$

$9x > 18$

$x > 2$

$2 < x < 23$



Try writing in exp form

1B. $\log_{16} x = \frac{5}{2}$

KeyConcept Property of Equality for Logarithmic Functions

Symbols	If b is a positive number other than 1, then $\log_b x = \log_b y$ if and only if $x = y$.
Example	If $\log_5 x = \log_5 8$, then $x = 8$. If $x = 8$, then $\log_5 x = \log_5 8$.

2 different types of problems: all logs same base (for now) b>1

only one log in the problem

11. $\log_6 \frac{1}{36} = x$

14. $\log_3 (3x + 8) = \log_3 (x^2 + x)$

check answers
(argument (antilog) must be pos.)

16. $\log_6 (x^2 - 6x) = \log_6 (-8)$

Example 3 Solve a Logarithmic Inequality

Solve $\log_3 x > 4$.

Argument must be positive
If = no problem.
My number vs 3^4
But if my exponent is bigger...

GuidedPractice

Solve each inequality.

3A. $\log_4 x \geq 3$

3B. $\log_2 x < 4$

argument must be positive

GuidedPractice

4. Solve $\log_5 (2x + 1) \leq \log_5 (x + 4)$. Check your solution.

Solve each inequality.

4. $\log_5 x > 3$

6. $\log_4 (2x + 5) \leq \log_4 (4x - 3)$

7. $\log_8(2x) > \log_8(6x - 8)$

28. $\log_2(4x - 6) > \log_2(2x + 8)$