Today's Plan:

Learning Target (standard): I will use properties of logarithms to rewrite expressions.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Logarithm Practice #1-16, 31, 32

1) $\log_y x = z$

2) $\log_y x = -11$

3) $\log_{\frac{18}{19}} y = x$

4) $\log_y x = 2$

5) $y^{16} = x$

6) $\left(\frac{5}{13}\right)^y = x$

7) $x^{-10} = y$

8) $x^{13} = y$

9) $\log_4 64 = 3$

10) $\log_2 32 = 5$

11) $\log_7\left(\frac{1}{49}\right) = -2$

12) $\log_4(-16) = und$

Logarithm Practice #1-16, 31, 32

13) $D:\left\{x \mid x > -\frac{1}{2}\right\}$

$I_x:\left(\frac{99999}{2},0\right)$

$I_y:(0,-5)$

14) $D:\left\{x \mid x > \frac{1}{3}\right\}$

$I_x:\left(\frac{2}{3},0\right)$

$I_y:-$

15) $D:\{x \mid x > 1\}$

$I_x:\left(\frac{401}{400},0\right)$

$I_y:-$

Logarithm Practice #1-16, 31, 32

16) $D:\left\{x \mid x > -\frac{13}{3}\right\}$

$I_x:\left(\frac{3112}{3},0\right)$

$I_y:(0,\log_5 13-5)$

31) $D:\{x \mid x > -3\}$

$I_x:\left(\frac{9991}{3},0\right)$

$I_y:(0,\log 9-4)$

32) $D:\{x \mid x > -5\}$

$I_x:\left(-\frac{359}{72},0\right)$

$I_y:(0,\log_6 10+2)$

Find domain and intercepts.

$$f(x)=2\log_{\frac{1}{2}}(8-2x)+4$$

D: $\{x \mid x<4\}$

$8-2x>0$

$-2x>-8$

$x<4$

I_y: $(0,-2)$

$y=2\log_{\frac{1}{2}}8+4$

$\log_{\frac{1}{2}}8=c$

$\left(\frac{1}{2}\right)^c=8$

$c=-3$

$y=2(-3)+4$

$y=-6+4$

$y=-2$

I_x: $(2,0)$

$0=2\log_{\frac{1}{2}}(8-2x)+4$

$-4=2\log_{\frac{1}{2}}(8-2x)$

$-2=\log_{\frac{1}{2}}(8-2x)$

$\left(\frac{1}{2}\right)^{-2}=8-2x$

$4=8-2x$

$-4=-2x$

$x=2$

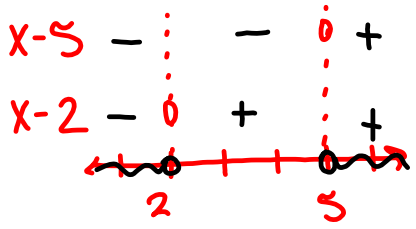
Find the domain and intercepts:

$$f(x)=\log\left(x^2-7x+10\right)$$

D: $\{x \mid x<2, x>5\}$

$x^2-7x+10>0$

$(x-5)(x-2)>0$



I_y: $(0,1)$

$y=\log(0-0+10)$

$y=\log 10$

$y=1$

$10^y=10$

$y=1$

I_x: $\left(\frac{7+\sqrt{13}}{2},0\right),\left(\frac{7-\sqrt{13}}{2},0\right)$

$0=\log(x^2-7x+10)$

$10^0=x^2-7x+10$

$1=x^2-7x+10$

$0=x^2-7x+9$

$x=\frac{7\pm\sqrt{49-4(1)(9)}}{2(1)}$

$=\frac{7\pm\sqrt{49-36}}{2}$

$x=\frac{7+\sqrt{13}}{2},\frac{7-\sqrt{13}}{2}$

Properties of Logarithms:

* $\log_a(MN) = \log_a M + \log_a N$

expansion

$\ln 6 = 1.792$

$\ln 6 = \ln(2 \cdot 3)$

$= \ln 2 + \ln 3$

$= 0.693 + 1.099$

$= 1.792$

Properties of Logarithms:

* $\log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$

$\ln 6 = 1.792$

$\ln 6 = \ln\left(\frac{12}{2}\right)$

$= \ln 12 - \ln 2$

$= 2.485 - .693$

$= 1.792$

Properties of Logarithms:

$* \log_a\left(M^r\right) = r \log_a M$

$\ln 4 = 1.386$

$\ln 4 = \ln(2^2)$

$= 2 \ln 2$

$= 2(.693)$

$= 1.386$

Properties of Logarithms:

$If \log_a M = \log_a N$

$M = N$

Properties of Logarithms:

If $M = N$,

$$\log_a M = \log_a N$$

Properties of Logarithms:

Change-of-base: $\log_a M = \dfrac{\log_b M}{\log_b a} = \dfrac{\ln M}{\ln a}$

$\log_2 5 = x$

$2^x = 5$

$= \dfrac{\log M}{\log a}$

$\log_2 5 = \dfrac{\ln 5}{\ln 2} = \dfrac{1.609}{.693} = 2.322$

$= \dfrac{\log 5}{\log 2} = \dfrac{.699}{.301} = 2.322$

$\log_2 5 = 2^x = 5$

$x = 2.322$

Expand.

$$\ln\left(x^2-5x-6\right)$$

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

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

Expand.

$$\log(4x)^3 =$$

$=3\log(4x)$

$=3[\log 4+\log x]$

$=3\log 4+3\log x$

Assignment:

Logarithm Practice

#17-30