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.

p.330 #14-44 even

14) $4\ln x+\frac{1}{2}\ln\left(1+x^2\right)$

*these are the last lines of the "proof"

* QUIZ on Friday! *

16) $\frac{1}{3}\log_5\left(x^2+1\right)-\log_5\left(x+1\right)-\log_5\left(x-1\right)$

18) $3\log x+\frac{1}{2}\log(x+1)-2\log(x-2)$

20) $\frac{4}{3}\ln(x-4)-\frac{2}{3}\ln(x+1)-\frac{2}{3}\ln(x-1)$

22) $\ln 5+2\ln x+\frac{1}{3}\ln(1-x)-\ln 4-\ln(x+1)$

p.330 #14-44 even

24) $\log_3\left(\frac{u^2}{v}\right)$

26) $\log_2\left(\frac{1}{x^3}\right)$

28) $\log\left(\frac{x^2+2x-3}{x^3+5x^2-8x-12}\right)$

30) $\log_3 x^9$

32) $\log\left[\sqrt[3]{x^3+1}\sqrt{x^2+1}\right]$

34) 42

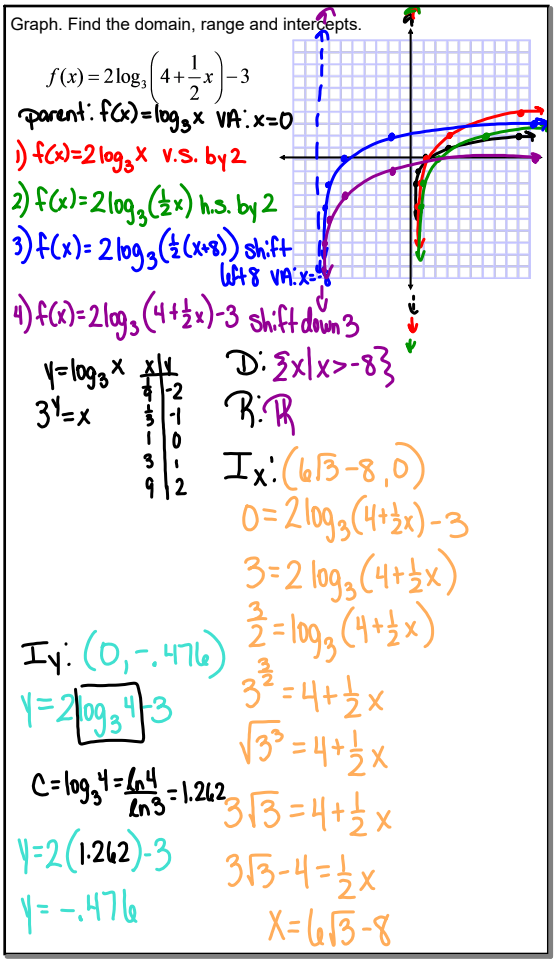
36) *skip*

38) 1.796

40) -3.907

42) 2.584

44) 0.303



Graph. Find the domain, range and intercepts.

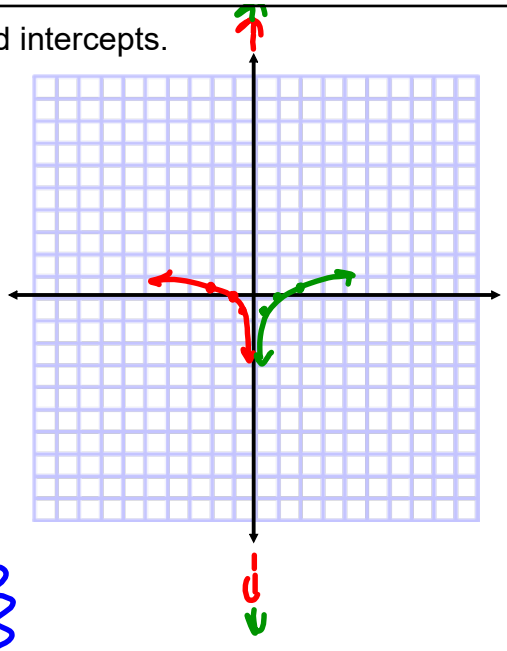
$$f(x)=\begin{cases}\ln(-x), x<0 \\ \ln x, x>0\end{cases}$$

$y=\ln(-x)$

x	y
-2	.693
-1	0
$-\frac{1}{2}$	-.693
0	VA

$y=\ln x$

x	y
0	VA
$\frac{1}{2}$	-.693
1	0
2	.693



D: $\{x \mid x \neq 0\}$

R: $\mathbb{R}$

I_x: $(-1,0), (1,0)$

I_y: —

Find domain and intercepts.

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

D: $\{x \mid -2<x<2\}$

$4-x^2>0$

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

	-2		0		2	
$2+x$	−	0	+	+	+	+
$2-x$	+	+	+	0	−	−

I_x: $\left(-\frac{\sqrt{15}}{2},0\right), \left(\frac{\sqrt{15}}{2},0\right)$

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

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

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

$\left(\frac{1}{2}\right)^2=4-x^2$

$\frac{1}{4}=4-x^2$

$-\frac{15}{4}=-x^2$

$\sqrt{x^2}=\pm\sqrt{\frac{15}{4}}$

$x=\frac{\sqrt{15}}{2}, -\frac{\sqrt{15}}{2}$

I_y: $(0,2)$

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

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

$\log_{\frac{1}{2}}4=c$

$\left(\frac{1}{2}\right)^c=4$

$c=-2$

$y=-\frac{1}{2}(-2)+1$

$y=1+1$

$y=2$

Write the expression as a sum/difference of logarithms:

$$\ln\left[\frac{(x+2)^2\sqrt{x-3}}{(3x-4)^5}\right]$$

$= \ln(x+2)^2\sqrt{x-3} - \ln(3x-4)^5$

$= \ln(x+2)^2 + \ln\sqrt{x-3} - 5\ln(3x-4)$

$= 2\ln(x+2) + \ln(x-3)^{\frac{1}{2}} - 5\ln(3x-4)$

$= 2\ln(x+2) + \frac{1}{2}\ln(x-3) - 5\ln(3x-4)$

Write the expression as a sum/difference of logarithms:

$$\ln\left[\frac{(2x-3)^4\sqrt{4-x}}{\sqrt[3]{(5x-6)^4}}\right]$$

$= \ln(2x-3)^4\sqrt{4-x} - \ln\sqrt[3]{(5x-6)^4}$

$= \ln(2x-3)^4 + \ln\sqrt{4-x} - \ln(5x-6)^{\frac{4}{3}}$

$= 4\ln(2x-3) + \ln(4-x)^{\frac{1}{2}} - \frac{4}{3}\ln(5x-6)$

$= 4\ln(2x-3) + \frac{1}{2}\ln(4-x) - \frac{4}{3}\ln(5x-6)$

Write the expression as a single logarithm:

$$\log_2 8 + \log_2(x-3) - \frac{1}{2}\log_2(x+4)$$

$$= 3 + \log_2(x-3) - \log_2(x+4)^{\frac{1}{2}}$$

$$= 3 + \log_2\left[\frac{x-3}{(x+4)^{\frac{1}{2}}}\right]$$

$$= 3 + \log_2\left[\frac{x-3}{\sqrt{x+4}}\right]$$

Review Assignment:

p.317 #7,11,15,19,23,27,33,35,43,63,69,73

p.330 #19,21,29,31,43

* check answers in the back of the book *

* QUIZ tomorrow *