Sec 4.3.1 Properties of Logarithms
Today- condensing

Log Rules

$$Log(AB) = LogA + LogB$$

$$Log\left(\frac{A}{B}\right) = LogA - LogB$$

$$Log(A^n) = n \times LogA$$

Log Form
$\log_2 16 = 4$

Equivalent to

Index Form
$2^4 = 16$

Consider learning to
"add like terms" first

4x +3x

before learning to solve...
3(2 +4x) +5x = -3x+2x +5

Condensing logs
serves the same
purpose...

Later we will
1. Condense/Isolate
a log
2. Rewrite
3. Solve resulting
equation

Condense-

$$\log_4 2 + \log_4 32$$

$$\log_4 64$$

$$= 3$$

*the sum of TWO logs is the PRODUCT of one

2(32) = 64

you can use a calculator, but also...

4 to what power is 64?

*To evaluate using a calculator, go to the "MATH" menu, then to "LOGBASE", where you can enter any base. The log on the face of the calculator assumes base 10.

Condense-

$$\log(4x-3) - \log x$$

$$\log \frac{4x-3}{x}$$

the difference of two logs is the quotient (division/fraction) of one

$$\frac{1}{2}\log x + 4\log(x-1)$$

$$\log x^{1/2} + \log(x-1)^4$$

$$\log x^{1/2}(x-1)^4$$

***Coefficients in the front can be moved to be a power/exponent of the argument.**

Condense-

$$3\ln(x+7) - \ln x$$

$$\ln(x+7)^3 - \ln x$$

$$\ln \frac{(x+7)^3}{x}$$

Condense-

$$4\log_b x - 2\log_b 6 - \frac{1}{2}\log_b y$$

$$\log_b x^4 - \log_b 36 - \log_b y^{1/2}$$

$$\log_b x^4 - \left(\log_b 36 + \log_b y^{1/2}\right)$$

$$\log_b x^4 - \left(\log_b 36y^{1/2}\right)$$

$$\log_b \frac{x^4}{36y^{1/2}}$$

Suggested Practice
Sec 4.3
page 477
41-68
the left column
(essentially, the odds, with a few of the more challenging)

41-65, 67 see back of text

66. $\log_4 (x+1)^2 \sqrt[3]{\frac{x}{y}}$

$\left(\frac{x}{y}\right)^{1/3}$

68. $\frac{1}{3}\left[\ln \frac{(x+6)^5}{x(x^2-25)}\right]$

$= \ln\left[\frac{(x+6)^5}{x(x^2-25)}\right]^{1/3}$ or $\ln \sqrt[3]{\text{same}}$