

L6
Logarithm Operations
Springboard 23.2

Warm-up

Rewrite in log form.

1) $2^3 = 8$

2) $4^3 = 64$

Rewrite in exponential form

3) $\log_3 81 = 4$

4) $\log_2 32 = 5$

Condense

5) $\log 5 + \log 2 - 4\log 3$

Expand

6) $\log \left(\frac{5x^2}{2} \right)$

7) $\ln x =$

How would you try to simplify this?

$$\log_2 3 + 2\log_2 5 - \log_2 3$$

I do:

$$\log_2 3 + 2\log_2 5 - \log_2 3$$

Condense by Power Property	$\log_2 3 + \log_2 5^2 - \log_2 3$ $\log_2 3 + \log_2 25 - \log_2 3$
Condense by Product	$\log_2 75 - \log_2 3$
Condense by Quotient	$\log_2 \left(\frac{75}{3}\right)$ $\log_2(25)$

We do:

$$\log_3 4 + 3\log_3 y - \log_3 3$$

Condense by Power Property	
Condense by Product	
Condense by Quotient	

You do:

$$2\log_4 3 + 3\log_4 2 - \log_4 4$$

Condense by Power Property	
Condense by Product	
Condense by Quotient	

$$\ln y + 3\ln x - \ln 4 + 2\ln y$$

Condense by Power Property	
Condense by Product	
Condense by Quotient	

I do:
Expand

$$\ln\left(\frac{2x}{3y}\right)$$

Expand by Quotient	
Condense by Product	
Condense by Power	

We Try:
 $\log_2\left(\frac{3x^2}{2y}\right)$

Expand by Quotient	
Condense by Product	
Condense by Power	

Evaluate without using a calculator.

I do:
 $\log_3 81 =$

Find the exponent with the matching base if possible.	$\log_3 3^4$
Simplify	4

We do:
 $\log_2 \left(\frac{1}{16}\right) =$

Find the exponent with the matching base if possible.	
Simplify	

You do:

$$\log_6 \left(\frac{1}{36}\right)$$

Find the exponent with the matching base if possible.	
Simplify	

Using a calculator

$$\log_2 8 = \frac{\log 8}{\log 2} = 3$$

$$\log_3 27 =$$

$$2\log_2 7 =$$

REFRESHER

Rewrite in log form

$$5^3 = 125$$

Rewrite in exponential form

$$\log_2 64 = 6$$

Condense:

$$3\log_2 2 + 2\log_2 3 - \log_2 x$$

Expand:

$$\ln \left(\frac{y^2 x}{2z^3} \right)$$

$\log_e x$ can also be written as:

Use a calculator to solve

$$\log_4 7 =$$