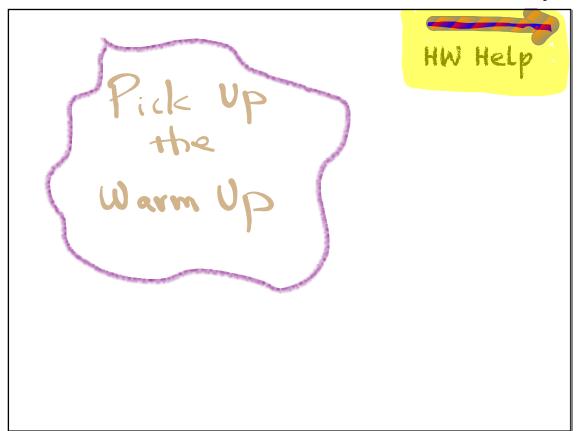
h January 08, 2018



$$\frac{1}{\sqrt{\frac{x}{x}}}$$
condense to
$$\frac{x + \frac{1}{x}}{x}$$

$$\frac{x}{\sqrt{x}} + \frac{1}{x}$$

$$\frac{x}{\sqrt{x}} + \frac{1}{x}$$



Convert from log to exponential form



A. Convert the following log equaiton to exponential form.

B. Then follow the same process from problem #3 above (in other words, take the log of both sides) to isolate n. If sucessful you can outsmart your calculator!

logab

You are now smarter than your calculator !!!

This is called the

## change of base formula

$$\log_a(b) = \frac{\log(b)}{\log(a)}$$

which, in fact, can be converted to any base

This is called the

# change of base formula

$$\log_a b = \frac{\log b}{\log a} = \frac{\log_n b}{\log_n a}$$

which, in fact, can be converted to any base

(5) Change each expression to ones with common logs only.

109 (3)

log\_(x)

logn (70)

Lastly, change the following log expression to one with base 5

 $log_3 4 = \frac{log 4}{log 3}$ 

This is called the

#### change of base formula

$$\log_a b = \frac{\log b}{\log a} = \frac{\log_n b}{\log_n a}$$

which, in fact, can be converted to any base

not helpful helpful convert to log 1.04 = 
$$\log 2$$
 $\chi = \log (2)$ 
1.04

#### **HW** Questions

Answer 
$$\frac{103a}{x=-3}$$
  
 $y=5$   
 $z=10$ 

$$(1,5)$$
  $5 = a(1)^2 + b(1) + C  $\rightarrow$   $\Box$   $5 = a + b + C$$ 

$$(3,19)$$
  $19 = a(3)^2 + b(3) + C$   $\blacksquare$   $\boxed{1}$   $19 = 9a + 3b + C$ 

$$(3,19)$$
  $19 = a(3) + b(-2) + C$   $-b$   $\boxed{111}$   $19 = 4a - 2b + C$ 

$$\boxed{111}$$
  $29 = 4a - 2b + c$ 

h

$$\log (x) = 0$$
 $\log (x) = 1$ 
 $\log (x) = 1$ 
 $\log (x) = 1$ 
 $\log (x) = 2$ 
 $\log (x) = 2$ 
 $\log (x) = 2$ 

Aim

Use properties of logs to simplify log expressions

Why?

because log equations can get more complex

$$5 \cdot |_{09_3}(x) - |_{09_3}(2x) = 14$$

Tape or Write into your notes

#### **Logarithm Properties**

The following definitions and properties hold true for all positive  $m \neq 1$ .

 $\log_m(a) = n \text{ means } m^n = a$ Definition of logs:

Product Property:  $\log_m(a \cdot b) = \log_m(a) + \log_m(b)$ 

 $\log_m(\frac{a}{b}) = \log_m(a) - \log_m(b)$ Quotient Property:

 $\log_m(a^n) = n \cdot \log_m(a)$ Power Property:

Take notes as we do

a. 
$$\log_{1/2}(4) + \log_{1/2}(2) - \log_{1/2}(5)$$

$$\log_{\frac{1}{2}}(8) - \log_{\frac{1}{2}}(5)$$

$$\log_{\frac{1}{2}}(8) - \log_{\frac{1}{2}}(5) \longrightarrow \log_{\frac{1}{2}}(\frac{8}{5})$$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

$$\log_m(\frac{a}{b}) = \log_m(a) - \log_m(b)$$

## b. $\log_2(M) + \log_3(N)$

(base is not the same)

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

c. 
$$\log(k) + x \log(m)$$

$$\log(k) + \log(m^{x})$$

$$\log(k \cdot m^{x})$$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

d. 
$$\frac{1}{2}\log_5 x + 2\log_5(x+1)$$

$$\log_{5}(x^{\frac{1}{2}}) + \log_{5}(x+1)^{2}$$

$$\log_{5}(x^{\frac{1}{2}}) + \log_{5}(x+1)^{2}$$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

e. 
$$\log(4) - \log(3) + \log(\pi) + 3\log(r)$$

$$\left| O_{3} \left( \frac{4\pi \pi^{3}}{3} \right) \right| \left| O_{3} \left( \frac{4}{3} r^{3} \pi \right) \right|$$

$$\left| O_{3} \left( \frac{4}{3} \pi r^{3} \right) \right|$$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

$$\log_m(\frac{a}{b}) = \log_m(a) - \log_m(b)$$

f. 
$$\log(6) + 23 \log(10)$$

$$\log(6) + \log(10^{23})$$
  
 $\log[6 \cdot 10^{23}]$ 

B.B.

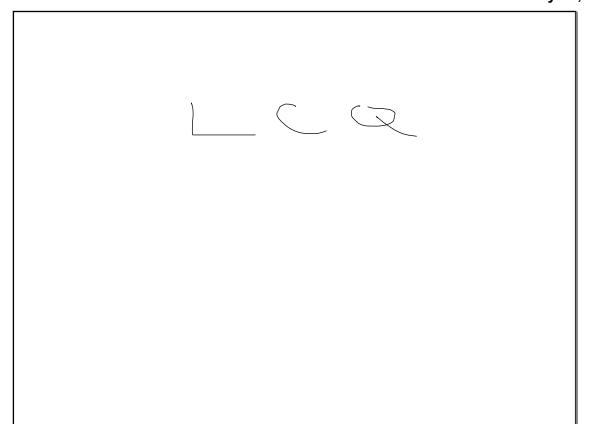
# 2 person - Pass backs

1st person makes does one step. Passes paper.

2nd person does a step, passes back.

Now backwards.

expand log 3m<sup>3</sup>p<sup>2</sup>



### **Assignment**

6.....41b, 113, 114a, 115, 122ab, 163