

**HW 5-6**

NAME \_\_\_\_\_

1. Find  $\log_7 7^{11}$
  
  
  
  
  
  
  
  
  
  
2. Expand each logarithmic expression.
  - a.  $\log_2(ab)$
  
  
  
  
  
  
  - b.  $\log_5\left(\frac{3w}{4}\right)$
  
  
  
  
  
  
  - c.  $\log(x^2y)$
  
  
  
  
  
  
  
  
  
  
3. Condense each logarithmic expression.
  - a.  $\log_4 5 + \log_4 v + \log_4 k$
  
  
  
  
  
  
  - b.  $\ln 12 - \ln 3$
  
  
  
  
  
  
  - c.  $3\log_5 x - 2\log_5 x$



4.

Consider the functions  $y = 5^x$  and  $y = 25^x$

a. Complete the table of values.

$x$	0	1	2	3	4
$y = 5^x$					
$y = 25^x$					

b. Write an equation relating  $\log_5 k$  and  $\log_{25} k$ .

5.

The parent function  $y = \log_3 x$  was translated up 1 unit to produce the graph of  $f$ . Which of the following functions would produce the same graph as  $f$ ?

A)  $g(x) = \log_3(3x)$

B)  $h(x) = \log_3(x + 1)$

C)  $w(x) = \log_3\left(\frac{1}{3}x\right)$

D)  $j(x) = 3\log_3(x)$

6.

Evaluate  $\log 10 + \log 100 + \log 1000 + \log 10000$  in two different ways. Explain your methods.

7. If  $\log w = g$ , what is  $\log 10w$ ?

8. If  $\log_3 \frac{x^2 w^4}{3z^5} = A \log_3 x + B \log_3 z + C \log_3 w + D$ , find  $A + B + C + D$ .

9. Simplify  $\log_b(b^x \cdot b^y)$  by first applying the property for the logarithm of a product.  
Then simplify  $\log_b(b^x \cdot b^y)$  by first applying the exponent rule for a product.  
Explain the relationship between exponent properties and logarithm properties.

10. Write three logarithmic expressions that are equivalent to  $\ln 32$ .