



4.4 PROPERTIES  
OF LOGARITHMS

4

2/7/17

Essential Question:

WHAT ARE THE PROPERTIES OF LOGS?

Questions:

Notes:

• IF  $b = a^x$ , THEN  $\log_a b = x$

•  $\log_a a = 1$  Ex)  $\log_5 5 = y$   $5^y = 5$   
 $y = 1$

•  $\log_a 1 = 0$  Ex)  $a^0 = 1$

SOME LOGARITHMIC EXPRESSIONS ARE  
UNDEFINED (THERE IS NO SOLUTION)  
Ex) EVALUATE  $\log_3(-27)$

$$3^x = -27$$

NO X VALUE WILL WORK!

NO SOLUTION - UNDEFINED

•  $\log_a b$  IS UNDEFINED IF  $b < 0$

•  $\log_a 0$  IS UNDEFINED SINCE  
 $a^x = 0$  HAS NO SOLUTION

•  $\log_a(a^n) = n$  Ex)  $a^n = a^n$

HW 4G p. 115 #1,2

4H p. 116 #1

4I p. 117 #1-3