

8.3 Logarithms + Logarithmic Functions

pg 492

Inverse Exponential Function $\log_b X = y$

$$b^y = X$$

Ex #1a: $\log_2 8 = 3$

$2^3 = 8$

b: $\log_4 256 = 4$

$4^4 = 256$

Ex $\log_3 27 = y$

$3^y = 27$

$3^y = 3^3$

$y = 3$

1A) $\log_4 16 = 2$

$4^2 = 16$

Ex #2a: $\log_3 15 = 3$

$3^3 = 27$

2b: $4^{1/2} = 2$

$(4^2)^y = 4^1$

$2y = 1$

$y = 1/2$

2A: $4^3 = 64$

$\log_4 64 = 3$

Ex #3: $\log_{16} 4 = y$

$16^y = 4$

$(4^2)^y = 4^1$

$2y = 1/2$

$y = 1/4$

3A: $\log_3 81 = y$

$3^y = 81$

$3^y = 3^4$

$y = 4$

3B: $\log_{1/2} 256 = y$

$(1/2)^y = 256$

$2^{-y} = 2^8$

$-y = 8$

$y = -8$

6) $\log_2 \frac{1}{128} = y$

$2^y = \frac{1}{128}$

$2^y = 2^{-7}$

$y = -7$

7) $\log_6 1 = y$

$6^y = 1$

$6^y = 6^0$

$y = 0$

pg 496 #1-6

1) $\log_8 512 = 3$

$8^3 = 512$

2) $\log_5 625 = 4$

$5^4 = 625$

3) $11^3 = 1331$

$\log_{11} 1331 = 3$

4) $16^{3/4} = 8$

$\log_{16} 8 = 3/4$

5) $\log_9 13 = y$

$\log_3 169 = y$

$13^y = 169$

$13^y = 13^2$

$y = 2$

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Inverse Exponential Function

$$\log_b X = y$$

$$b^y = X$$

EX $\log_3 27 = y$

$$3^y = 27$$

$$3^3 = 3^3$$

$$y = 3$$

Ex #1a: $\log_2 8 = 3$

$$2^3 = 8$$

b: $\log_4 256 = 4$

$$4^4 = 256$$

1A) $\log_4 16 = 2$

$$4^2 = 16$$

EX #2a: $15^3 = 3375$

$$\log_3 375 = 3$$

2b: $4^{1/2} = 2$

$$\log_4 2 = 1/2$$

2A: $4^{1/2} = 2$

$$\log_4 64 = 3$$

EX #3: $\log_{16} 4 = y$

$$16^y = 4$$

$$(4^2)^y = 4^1$$

$$2y = 1$$

$$y = 1/2$$

3A: $\log_3 81 = y$

$$3^y = 81$$

$$3^4 = 3^4$$

$$y = 4$$

3B: $\log_{1/2} 256 = y$

$$(1/2)^y = 256$$

$$(2^{-1})^y = 2^8$$

$$-y = 8$$

$$y = -8$$

256

128

64

32

16

8

4

2

1

128

64

32

16

8

4

2

pg 496 #1-6

1. $\log_8 512 = 3$

$$8^3 = 512$$

2. $\log_5 625 = 4$

$$5^4 = 625$$

3. $11^3 = 1331$

$$\log_{11} 1331 = 3$$

4. $16^{3/4} = 8$

$$\log_{16} 8 = 3/4$$

5. $\log_{13} 169 = y$

$$13^y = 169$$

$$13^2 = 13^2$$

$$y = 2$$

6. $\log_2 1/128 = y$

$$2^y = 1/128$$

$$2^{-7} = 2^{-7}$$

$$y = -7$$

7. $\log_6 1 = y$

$$6^y = 1$$

$$6^0 = 6^0$$

$$y = 0$$