

7.4 Logarithms

Quick warm-up:

① $2^x = 8$

③
 $2^3 = 8$

② $4^x = 16$

2

③ $2^x = 1$

0

④ $5^x = \frac{1}{5}$

Intro to Logs:

$$\log_2 16 = 4$$

$2^? = 16$

W E G O 2 16 = 4
h x o n v
a p e s t o
t o n s g
e e e l
h h h t

Practice!

① $\log_4 16 = 2$

$4^x = 16$

② $\log_6 216 = 3$

$6^? = 216$

③ $\log_2 4$

2

④ $\log_3 27$

3

⑤ $\log_{10} 1000 = 3$

$10^? = 1000$ because

⑥ $\log_5 125 = 3$

$5^3 = 125$

$$10^3 = 1000$$

$$\textcircled{7} \log_4\left(\frac{1}{4}\right) \textcircled{-1}$$

$$\text{WEGO}_4\left(\frac{1}{4}\right)$$

$$4^? = \frac{1}{4}$$

$$\textcircled{8} \log_6 1 \textcircled{0}$$

$$\text{WEGO}_6 1$$

$$6^? = 1$$

$$\textcircled{9} \log_2\left(\frac{1}{4}\right) \textcircled{-2}$$

Rewrite in Logarithmic Form:

$$\textcircled{1} 3^4 = 81$$

$$\log_3 81 = 4$$

$$\textcircled{2} 81^{\frac{1}{2}} = 9$$

$$\text{WEGO}_{81} 9 = \frac{1}{2}$$

$$\log_{81} 9 = \frac{1}{2}$$

$$81^{\frac{1}{2}} = 9$$

$$\textcircled{3} 7^{-1} = \frac{1}{7}$$

$$\log_7\left(\frac{1}{7}\right) = -1$$

Rewrite in Exponential Form:

$$\textcircled{1} \log_2 64 = 6$$

$$2^6 = 64$$

$$\textcircled{2} \log_9\left(\frac{1}{3}\right) = -\frac{1}{2}$$

$$9^{-\frac{1}{2}} = \frac{1}{3}$$

$$\textcircled{3} \log_8\left(\frac{1}{4}\right) = -\frac{2}{3}$$

$$8^{-\frac{2}{3}} = \frac{1}{4}$$

Using your calculator to evaluate Logs

common Log: $\log_{10} (\quad)$ base of 10

natural log: $\log_e (\quad) = \ln (\quad)$ $\log_{10} 100 = 2$

evaluate:

① $\log 27 \rightarrow 10^x = 27$
1.431

② $\log(\frac{3}{2}) \rightarrow 10^x = \frac{3}{2}$
.176

③ $\ln(1) \rightarrow e^x = 1$
0
 $x=0$

EXIT SLIP

Solve:

① $\log_2 32$

② $\log_5 25$

③ $\log_4 (\frac{1}{16})$

④ Rewrite in Log form: $3^4 = 81$