

7.2: Evaluating Logarithms

Calculator;

$$\log_{10} 100 = x$$

$$10^x = 100$$

$$x = 2$$

$$\log_{10} \frac{1}{10} = x$$

$$10^x = \frac{1}{10}$$

$$x = -1$$

Changing Logs to Exponential form.

$$1. \log_2 32 \Rightarrow x$$

$$2^x = 32$$

$$2^x = 2^5$$

$$x = 5$$

$$\log_b N = e$$

$$b^e = N$$

$$2. \log_3 \frac{1}{27} = x$$

$$3^x = \frac{1}{27}$$

$$\cancel{3}^x = \cancel{3}^{-3}$$

$$x = -3$$

$$3^x = 27^{-1}$$

$$3^x = (3^3)^{-1}$$

$$3. \log 10000$$

calculator

$$= 4$$

$$\log_{10} 10000 = x$$

$$10^x = 10000$$

$$10^x = 10^4$$

$$x = 4$$

Express as a logarithm

$$1. 2^4 = 16$$

$$\log_2 16 = 4$$

$$2. 3^{-4} = \frac{1}{81}$$

$$\log_3 \frac{1}{81} = -4$$

$$b^e = N$$

$$\log_b N = e$$

Solve each Logarithm.

$$1. \log_2 \frac{1}{64} = x$$

$$2^x = \frac{1}{64}$$

$$2^x = 64^{-1}$$

$$2^x = (2^6)^{-1}$$

$$2^x = 2^{-6}$$

$$\boxed{x = -6}$$

$$2. \log_5 7 = x$$

$$5^x = 7$$

* no like base, use logarithms

$$x = \frac{\log 7}{\log 5}$$

$$x \approx 1.21$$

(better explained
in properties
later)

$$3. e^x = 7$$

↳ natural log $\Rightarrow \ln x$

$$x = \frac{\ln 7}{\ln e}$$

$$e \approx 2.718$$

$$x \approx 1.95$$

$$e^x$$

$$e^1 = 2.718...$$