

Evaluating Logarithmic Expressions

$$1) \log_2 112 - \log_2 7 = 4 \quad 2) \log \sqrt{10.1}$$

$$\log_2 \frac{112}{7} = x$$

$$\log_2 16 = -x$$

$$4$$

$$x = \log_2 2$$

$$x = \log_2 2$$

$$\log_2 7$$

$$x = .3562$$

$$3) (1.1)^2 = 2$$

$$\log_2 2 = x$$

$$\log_2 1.1 = x$$

$$x = \log_2 1.1$$

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$$3) \log_{12} 9 + \log_{12} 16$$

$$\log_{12} 144$$

$$2$$

$$4) e^{3 \ln 5} = x$$

$$\ln x = 3 \ln 5$$

$$\ln x = \ln 5^3$$

$$\ln x = \ln 125$$

$$x = 125$$

Solving using Change of Base

$$1) \log_2 112$$

$$\frac{\log 112}{\log 2}$$

$$6.81$$

Change of Base Formula

$$\log_b a = \frac{\log a}{\log b} = \frac{\ln a}{\ln b}$$

$$2) 3^{-x} = 0.7$$

$$\log_3 0.7 = -x$$

$$\frac{\log 0.7}{\log 3} = -x$$

$$-0.325 = -x$$

$$0.325 = x$$

$$3) (1.1)^x = 2$$

$$\log 2 = x$$

$$\frac{\log 2}{\log 1.1} = x$$

$$x = 7.272$$

$$4) x = \log_7 2$$

$$x = \frac{\log 2}{\log 7}$$

$$x = 0.3562$$

Solve -

$$1) 10 = 7(1 + e^{-x})$$

$$10 = 7 + 7e^{-x}$$

$$3 = 7e^{-x}$$

$$4 = e^{-x}$$

$$\ln 4 = -x$$

$$-1.39 = x$$

$$-1.39 = x$$

$$\ln(\ln(e^{200}))$$

$$\ln e^x = x \cdot 200$$

$$e^x = e^{200}$$

$$x = 200$$

$$\ln(\ln e^{200})$$

$$e^x = e$$

$$x = 200$$

$$\ln(200)$$