

Log Base 10

(Default for calculator)

Ex) use a calculator to evaluate
 $\log(2) = .301$

Natural Logs

$\log_e x$ is written $\ln x$

use the \ln key on calculator

Ex) Evaluate $\frac{\ln 4}{\ln 2} = 2$

HW 4K p. 120 #1

Since $y = \ln x$ is the inverse of $y = e^x$

• $\log_a (a)^x = x$ and $a^{\log_a x} = x$

• $\ln(e^x) = x$ and $e^{\ln x} = x$

• $\log(10^x) = x$ and $10^{\log x} = x$

* We can use this to solve equations (Yay!)
By taking either \log (Base 10) or \ln
of both sides, or raising both sides
with a base of 10^- or e^-

Ex) a. Solve $e^x = 2.3$

$$\cancel{\ln(e^x)} = \ln(2.3)$$

$$x = \ln(2.3) \approx .833$$

b) $\ln x = -1.5$

$$\cancel{e^{\ln x}} = e^{-1.5}$$

$$x = e^{-1.5} \approx 0.223$$

c) $10^x = 0.75$

$$\cancel{\log(10^x)} = \log(0.75)$$

$$x = \log(0.75)$$

$$x \approx -0.125$$

Ex) Given $f(x) = \frac{1}{3}e^{2x}$, find $f^{-1}(x)$

$$3 \cdot x = \frac{1}{\cancel{3}} e^{2y} \cdot \cancel{3}$$

$$3x = e^{2y}$$

$$\ln(3x) = \ln(\cancel{e^{2y}})$$

$$f^{-1}(x) = \frac{\ln(3x)}{2} = \frac{\cancel{2}y}{\cancel{2}}$$

HW8 4L p122. #1-9

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