Number: Textbook Section:
Title:

For #1-4, find f^{-1} for each function. Give the domain, range and asymptote for f and f^{-1}.

1. $f(x) = 6^{x-1}$

2. $f(x) = 2^{3x+1} - 6$

3. $f(x) = \ln(x+4)$

4. $f(x) = 2 - \log_3(x+1)$

For #5-9, evaluate the expression.

5. $\log_5 25$

6. $\log_3 81$

7. $\log_{81} 3$

8. $\log_b 1$

9. $\log_a 0$

The pH of a solution is defined to be

$$\text{pH} = -\log\left[\text{H}^+\right],$$

where $[H^+]$ is the concentration of the hydrogen ion in molarity (M).

10. Find the pH of stomach acid if $\left[\text{H}^+\right] = 0.0316\text{M}$.

11. Find $[H^+]$ of seawater if the pH is 8.2.

The sound level in decibels (dB) of a noise is given by the formula

$$dB = 10\log\frac{I}{I_o},$$

where I is the intensity (in watts/m^2) and $I_0 = 10^{-12}$ watt/m^2 is the smallest intensity detectable by the human ear.

12. Find the decibel levels of the following.
    a) Normal conversation ($I = 10^{-7}$ watt/m^2)

    b) Pain threshold ($I = 10^{2}$ watt/m^2)

13. Find the intensity I of the following.
    a) A whisper (30 dB)

    b) The front row of a rock concert (120 dB)