I. Logarithmic Functions:

1. \( f(x) = \log_b(x) \iff x = b^{f(x)} \)
   \( i.e., \) inverse function to the exponential function...

2. If \( b > 1 \), then

   \( y \)-axis is a vertical asymptote \( (y \to -\infty \text{ as } x \to 0) \)
I.3. If $0 < b < 1$, then

$y$-axis is a vertical asymptote ($y \to +\infty$ as $x \to 0$)

II. Properties: see p.361
III. Two Special Logarithms:

1. $f(x) = \ln(x)$ \(i.e., \log_e(x)\) is the natural log
2. $f(x) = \log(x)$ \(i.e., \log_{10}(x)\) is the common log
3. Applications include earthquake (Richter scale) magnitude, sound (decibel scale) level, star luminosity (brightness), etc.

IV. Examples (p.367): Exercises #10-32(even)
Restating the essential idea...

\[ y = \log_b(x) \iff x = b^y \]

i.e., \( \log_b(x) \) represents the “power” needed to raise the base \( b \) up to such that it equals the value of \( x \).

IV. Examples (p.367): continued

Exercises #34-46, 70-120 (even)

HW: pp.367-368 / Exercises #9-31 (odd), 35, 39, 45, 59-93 (odd), 103, 107, 113-119 (odd)

Read section 4.3 (pp.372-379)