§ 3.6: RATIONAL FUNCTIONS — SLANT ASYMPTOTES, p. 309.

Key — Division of Polys.

A. Problem §3.6 p 313: #57. (Modified instructions): Find the slant asymptote.

\[ r(x) = \frac{x^2}{x-2} \]

Sol. Re-write \( r(x) = \frac{P(x)}{Q(x)} \) as \( S(x) + \frac{R(x)}{Q(x)} \)

Use Synth. Div.

\[
\begin{array}{r}
2 & 1 & 0 & 0 \\
& 2 & 4 & 4 \\
\end{array}
\]

\[ r(x) = x + 2 + \frac{4}{x-2} \]

The slant asymptote is \( y = x + 2 \).

B. Problem §3.6: p. 313: #64. Find S.A. (Slant Asymptote)

\[ r(x) = \frac{2x^3 + 2x}{x^2 - 1} \]

Sol. Divide (Long Division — can't use S.D.)

\[ \frac{2x}{x^2 - 1} \]

\[ \div \frac{2x^3 + 0x^2 + 2x + 0}{2x^3} \]

\[ 4x + 0 \]

\[ r(x) = 2x + \frac{4x}{x^2 - 1} \]

The slant asymptote is \( y = 2x \).

§ 4.1: Exponential Functions, p. 328.

Review — You read & review

pp. 328—334 (bottom)


§ 4.2: Logarithmic Functions, p. 342.

All review — You Read.


5 MAJOR IDEAS.

1. \( \log_b a = x \) means \( b^x = a \)

2. \( \log_b (AB) = \log_b A + \log_b B \) (Law 1)

3. \( \log_b \left( \frac{A}{B} \right) = \log_b A - \log_b B \) (Law 2)

4. \( \log_b (A^c) = c \log_b A \) (Law 3)
**Problem:** 5.4.3 #3578 #32 — Combine

\[ \log_3 5 + 5 \log_3 2. \]

**Solution:**

1. \[ \log_3 5 + 5 \log_3 2 = \log_3 5 + \log_3 2^5 \]
2. \[ = \log_3 5 + \log_3 32 = \log_3 (5 \cdot 32) = \log_3 160 \]
3. \[ \log_3 5 + 5 \log_3 2 = \log_3 160. \]