I. Rational Functions (p.319):

\[ R(x) = \frac{P(x)}{Q(x)} \]

where both \( P(x) \) and \( Q(x) \) are polynomials, \( Q(x) \neq 0 \).

II. Simplest Rational Function (p.320):

\[ f(x) = \frac{1}{x} \]

see Figure 3.70

1. Domain: \( D = \{ x \mid \text{} \} \)
2. Range: \( R = \{ y \mid \text{} \} \)
3. Graph: \( y = 1/x \)
4. Horizontal asymptote:
5. Vertical asymptote:
6. Notation for asymptotes of $y = 1/x$:
   a. The value of $y$ approaches zero as the value of $x$ goes to positive or negative infinity...
      \[ i.e., \quad y \to 0 \quad as \quad x \to \pm \infty \]
   b. The value of $y$ goes to infinity as the value of $x$ approaches zero...
      \[ i.e., \quad y \to \pm \infty \quad as \quad x \to 0 \]

III. Asymptotes of $y = f(x)$:
   1. Horiz. asymptote @ $y = k$:
      occurs when $y \to k$ as $x \to \pm \infty$
   2. Vert. asymptote @ $x = k$:
      occurs whenever $y \to \pm \infty$ as $x \to k$
III.3. Oblique asymptotes: not covered

IV. More Rational Function Graphs:
   pp.330-331 / Exercises #6-16(even), 34, 36, 56, 58, 74-80(even)

HW: pp.330-331 / Exercises #1-19(odd), 21, 33, 35, 73-79(odd)