

### Summary of Asymptotic Dance of Rational Functions

$$f(x) = \frac{g(x)}{h(x)}$$

The ratio of the highest term, or leading term, in both the numerator and denominator is:

$$\frac{ax^m}{bx^n}$$

$m < n$	Horizontal asymptote is the x-axis ( $y = 0$ ).
$m = n$	Horizontal asymptote is $y = k$ ( $k \neq 0$ ) where $k = \frac{a}{b}$ .
$m = n + 1$	Slant asymptote of the form of a line $y = kx$ ( $k \neq 0$ ) where $k = \frac{a}{b}$ .
$m > n$ where $m - n > 1$	Nonlinear asymptote, quadratic if $m - n = 2$ , cubic, if $m - n = 3$ , etc.