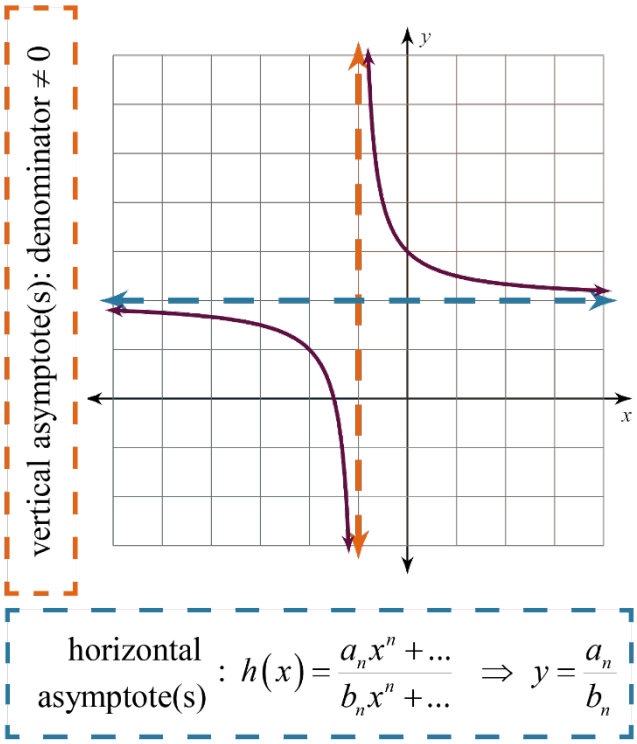
GRAPHING RATIONAL FUNCTIONS: GUIDED NOTES

Definitions

Rational function: $\frac{p(x)}{q(x)} = \frac{a_m x^m + \ldots + a_0}{b_n x^n + \ldots + b_0}$

where $p(x)$ and $q(x)$ are polynomials, and $q(x) \neq 0$

Asymptote: A line (often dashed) that a curve approaches but does **not** cross



How to Graph a Rational Function

Step 1) Find the asymptote(s).

- Since the denominator cannot equal zero, find the x-value(s) that cause this. These are the vertical asymptote(s).
- Rewrite the function so that the degree of the top and bottom of the fraction are the same, then write a ratio of the coefficients. This is the horizontal asymptote.

Step 2) Sketch the asymptotes with dashed lines.

Step 3) Make a table.

- Pick x-values based on the vertical asymptote.

Step 4) Plot points and connect dots.

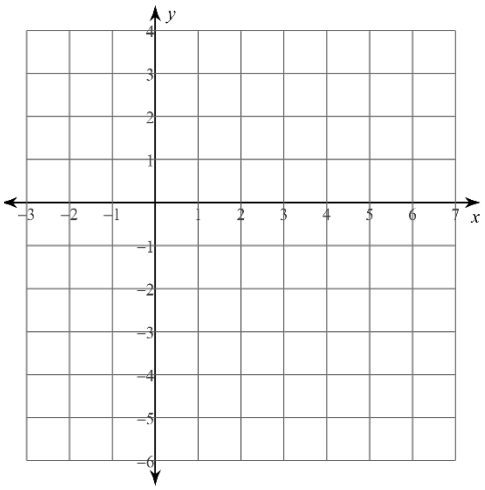
- Be careful to ***not*** cross the asymptotes!

Examples

Graph the function. Be sure to label the asymptotes.

1) $y = \dfrac{-3x+9}{3x-6}$

x	y



2) $y = \dfrac{2}{x+3}+1$

x	y