



Vocabulary: Rational Functions



Vocabulary

- **Asymptote** – a line that a graph approaches more and more closely.
 - Asymptotes are most commonly shown as dashed lines to represent that they are not a part of the graph itself.
 - A *horizontal asymptote* is a horizontal line that a graph approaches as the value of x goes to positive or negative infinity.
 - For example, the graph of the rational function $y = \frac{2}{x-3} + 4$, shown to the right, has a horizontal asymptote of $y = 4$.
 - A *vertical asymptote* is a vertical line that a graph approaches.
 - For example, the graph of the rational function $y = \frac{2}{x-3} + 4$, shown above has a vertical asymptote of $x = 3$.
 - Vertical asymptotes occur at an x -value for which the function is undefined, usually due to division by zero.
- **Hyperbola** – a type of graph whose shape results from graphing a rational function.
 - The graph of a hyperbola has two disconnected and symmetrical parts, called *branches*.
- **Rational function** – a function of the form $y = \frac{\text{polynomial}}{\text{polynomial}}$, where the denominator cannot be zero.
 - For example, $y = \frac{2}{x-3}$ and $y = \frac{x^2 + 2x}{x+4}$ are both rational functions.
- **Translation** – a *transformation* that shifts every point of a figure in the same distance and same direction.
 - A translation can shift a graph horizontally, vertically, or both.

