

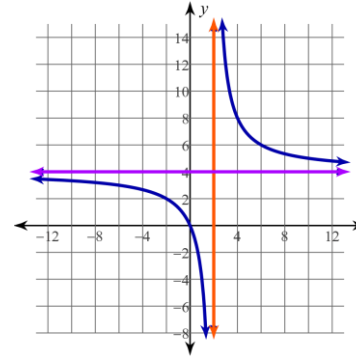
SM3 VOCAB 3-5 (Reciprocal Function)

Vertical Asymptote: A vertical line that the graph approaches but never reaches. The x-value of the vertical asymptote causes division by zero in the equation of the graph. Therefore, vertical asymptotes are **never crossed**.

Horizontal Asymptote or Oblique/Slant Asymptote: A horizontal or slanted line that the graph approaches **as an end-behavior** but never reaches. The graph may cross the asymptote in the middle, but at the right and left ends of the graph is becomes the end-behavior of the graph. For the equation below: $x \rightarrow \infty, y \rightarrow 4$ $x \rightarrow -\infty, y \rightarrow 4$

Vertical Asymptote: is caused by a zero of the denominator that does NOT disappear due to simplification.

$$y = \frac{1}{x - 1} + 4$$



Asymptotes are not part of the graph but you can see them easily. We show them as dotted lines.

X-intercepts: are real number zeroes of the rational function. If the rational function is a single fraction, the zeroes of the numerator will be yield x-intercepts. Sometimes zeroes of the numerator disappear due to simplification, in this case they will not be yeild x-intercepts.

Asymptotic Behavior: when drawing a graph it must clearly show that the graph is approaching the asymptote. (None of the graphs below are from the reciprocal function.)

