Math 1090 – Business Algebra
Section 3.5 Rational Functions

Objectives:
• Identify a rational function.
• Determine the domain and intercepts of a rational function.
• Determine vertical and horizontal asymptotes.
• Sketch a rational function.

Definition

Rational Function \( f(x) = \frac{n(x)}{d(x)} \)

where \( n(x) \) and \( d(x) \) are polynomials.

Asymptotes

Vertical asymptotes

How to graph a rational function

1) find the domain

a) find VA

b) find HA

2) Find x and y-intercepts

Horizontal asymptotes

3) Plot intercept points and at least one point on all sides of the vertical asymptotes.

4) Fill in the graph with smooth curves that approach the asymptotes.
Ex 1: Analyze and graph.

a) \( f(x) = \frac{2 + x}{x - 1} \)

Ex 2: Analyze and graph.  \( g(x) = \frac{x-3}{2x^2 - 5x - 3} \)