

A function that can be written in the form...

$$y = \frac{p(x)}{q(x)} \text{ where } p(x) \text{ and } q(x) \text{ are polynomials}$$

Vertical Asymptote

$$\text{set } q(x) = 0$$

Zero or x -intercept

Set $y = 0$, solve for x

Horizontal Asymptote

if $\deg p(x) > \deg q(x)$, no horizontal asymptote.

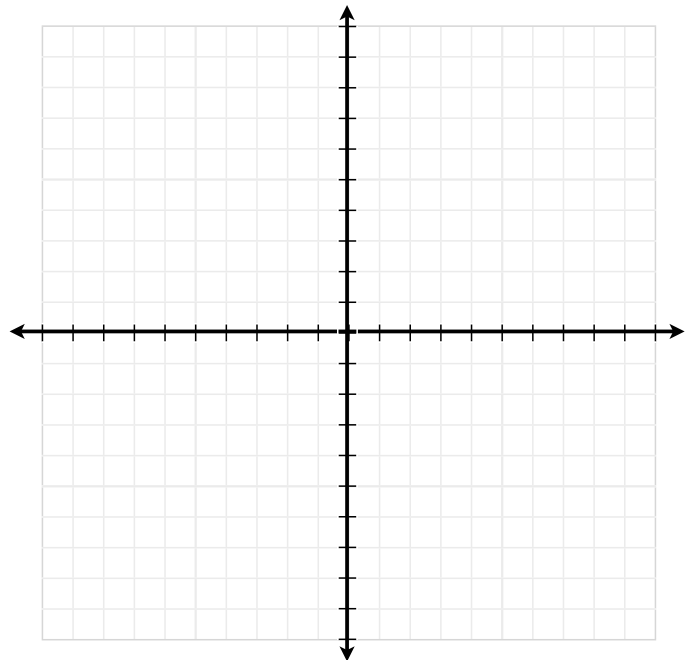
if $\deg p(x) < \deg q(x)$, $y = 0$

if $\deg p(x) = \deg q(x)$, divide leading coefficients

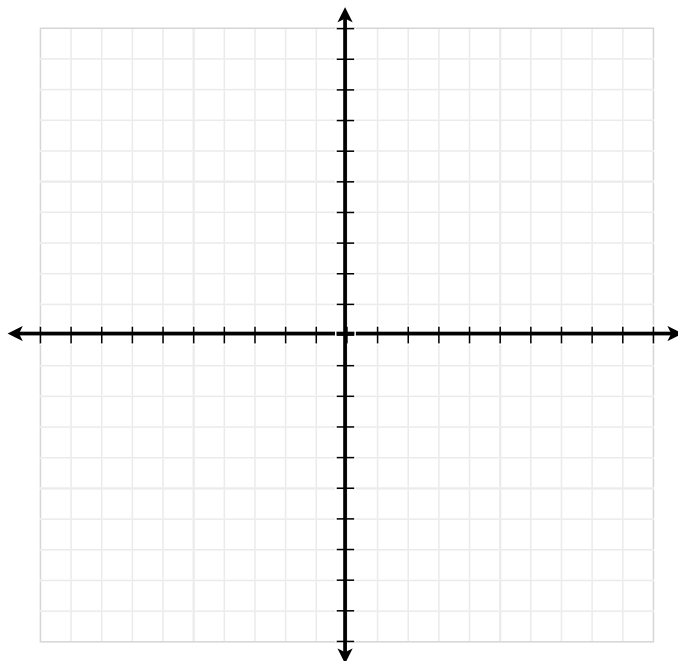
y -intercept

Set $x = 0$, solve for y

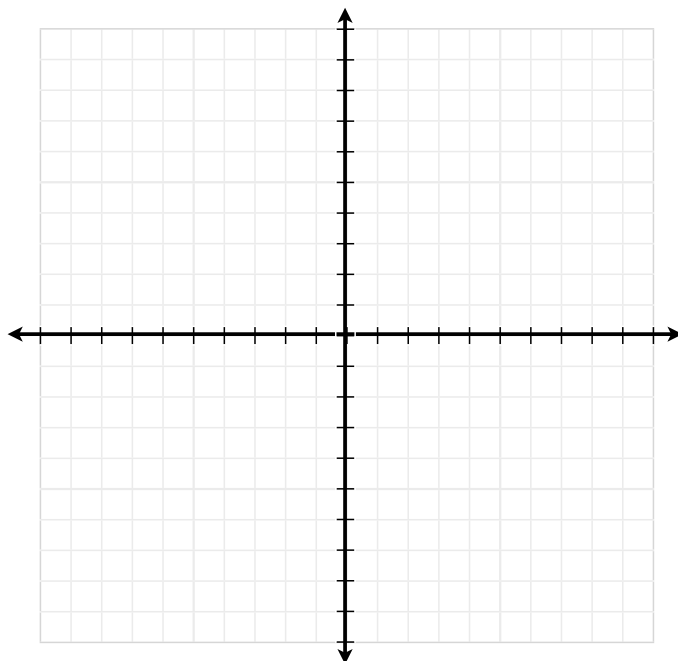
$$y = \frac{3}{x-3}$$



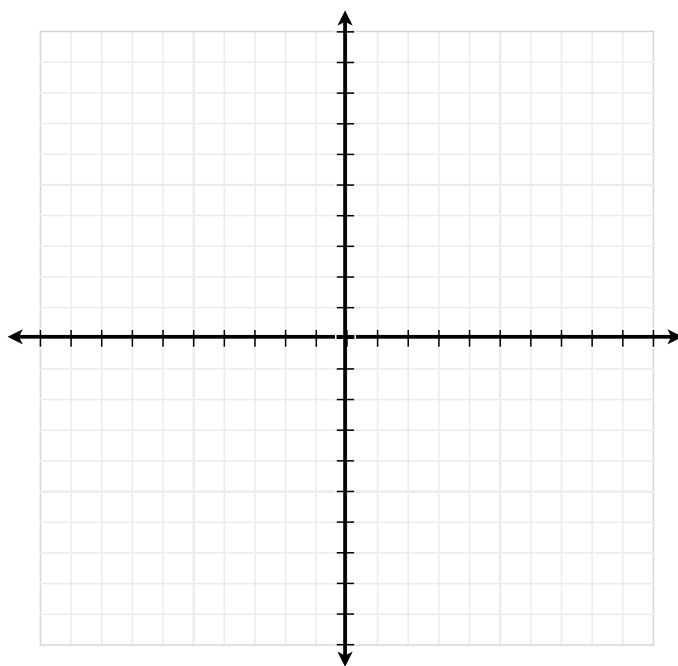
$$y = \frac{-4}{x+2}$$



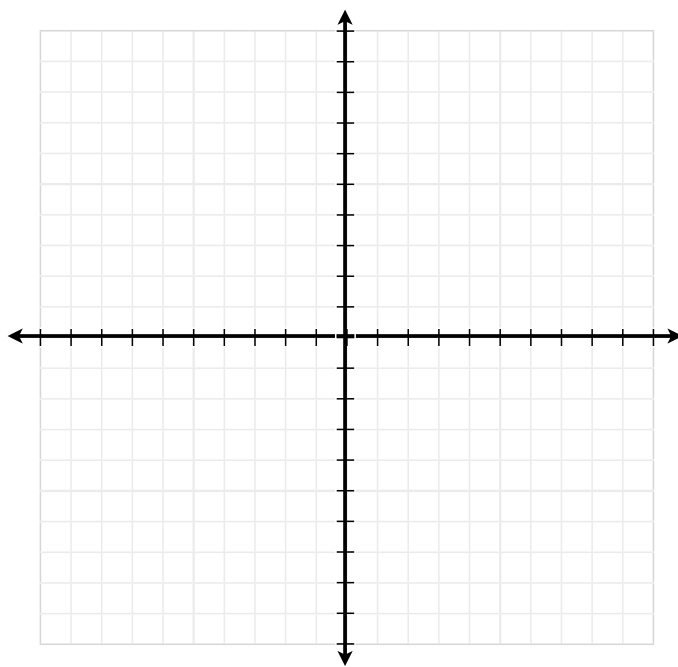
$$y = \frac{x-1}{x}$$



$$y = \frac{-x + 3}{x - 2}$$



$$y = \frac{2}{(x - 2)^2}$$



$$y = \frac{-1}{(x + 1)^2}$$

