Chapter 8.3: Graph General Rational Functions

$f(x) = \frac{p(x)}{q(x)}$ polynomials

the x-int are the real zeros of p(x) Top

the vertical asymptotes are the real zeros of q(x) → bottom

the graph has at most one horizontal asy. determined but the degrees of p(x) and q(x) degree = highest exponent

if the degree of p(x)=m and q(x)=n

Top bottom

m<n - asymptote y=0

m=n - asymptote y=a/b leading terms of p(x)/q(x)

m>n no asymptote, end behavior

$$y = \frac{a}{b} x^{m-n}$$

Graph state domain and range

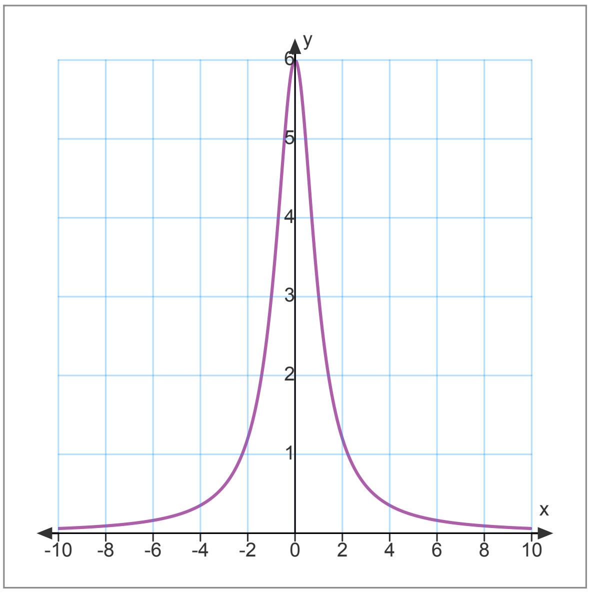
$$y = \frac{6}{x^2+1}$$

$x^2 + 1 = 0$

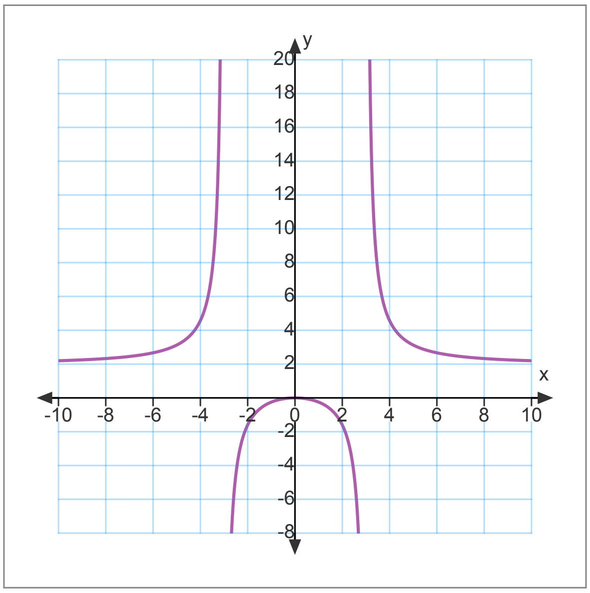
$-1 \quad -1$

$\sqrt{x^2} = \sqrt{-1}$

$x = \pm i$



graph: $y = \dfrac{2x^2}{x^2 - 9}$



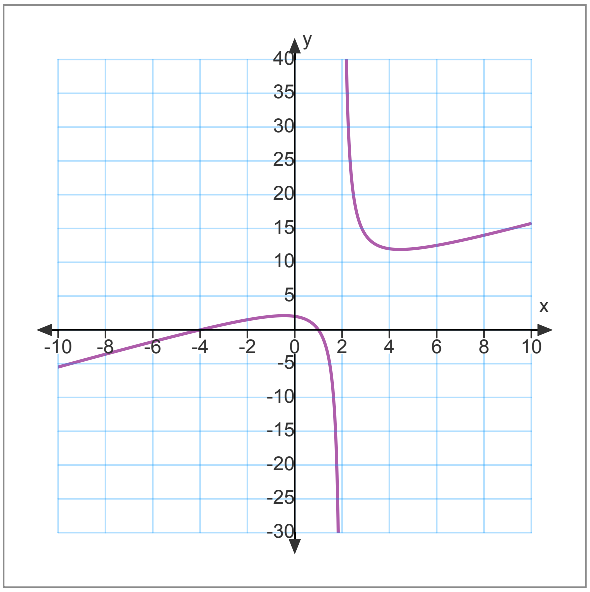
$x^2 - 9 = 0$

$x^2 = 9$

$x = \pm 3$ — vert

$y = 2$ → horz

graph: $y = \dfrac{x^2 + 3x - 4}{x - 2}$



$y = x^{2-1}$

$x - 2 = 0$

$x = 2$

$y = x$

A food manufacturer wants to find the most efficient packaging for a can of soup with a volume of 342 cubic centimeters. Find the dimensions of the can that has this volume and uses the least amount of material possible.

Homework: Chapter 8.3 pg. 568
#'s 3-6,8,10,16,20,26,32