

$$f(x) = \frac{1}{x} = y$$

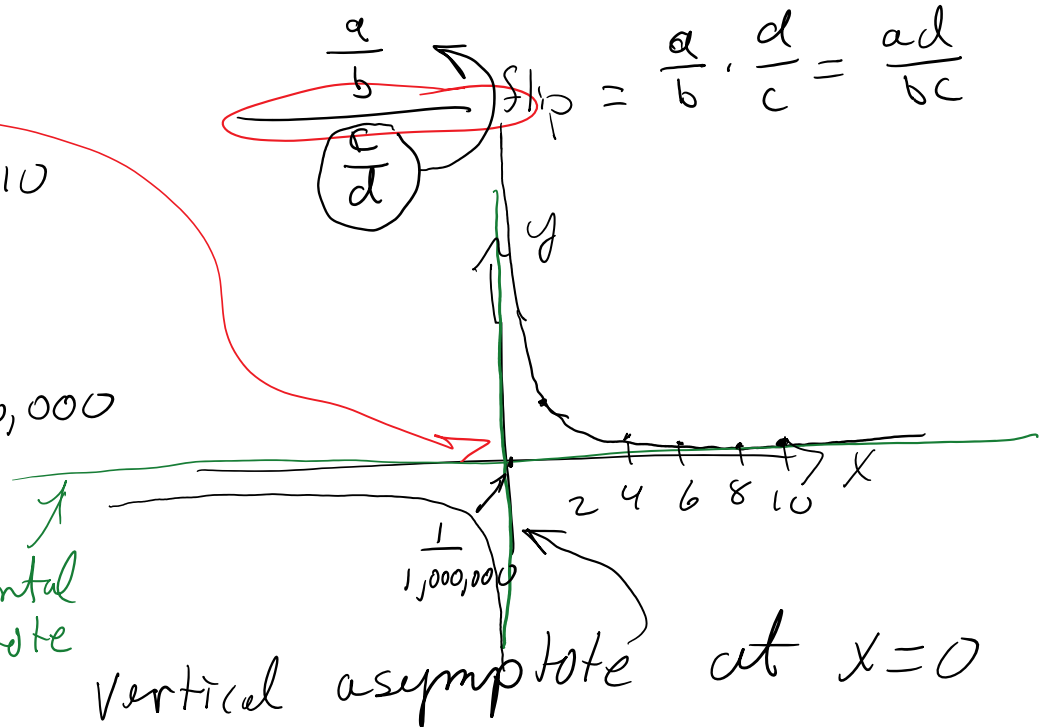
x	y = 1/x
1,000,000	y = 1/1,000,000
1,000	y = 1/1,000
100	y = 1/100
10	y = 1/10
1	y = 1
0	DNE
1/10	y = 1/10 = 10
1/100	y = 100
1/1000	y = 1000
1/1,000,000	y = 1,000,000

Recall:

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$$

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$

$$\frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$



y=0 Horizontal asymptote

Vertical asymptote at x=0

Asymptote is a line that the graph gets close to but doesn't get to.

Vertical asymptote

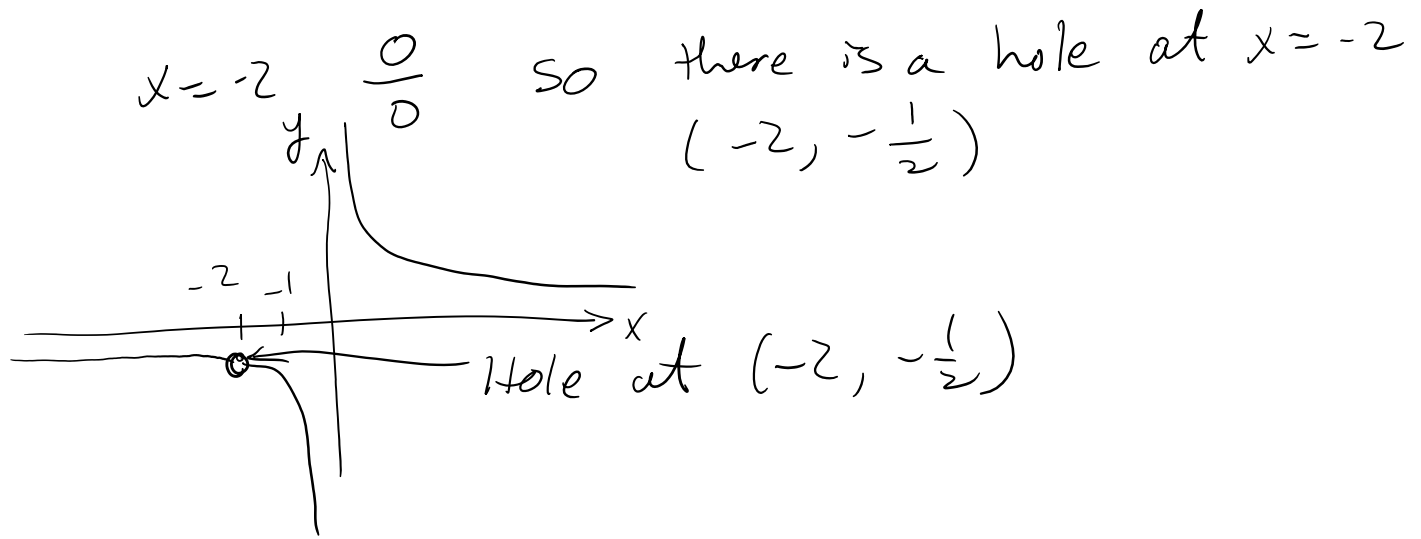
Not zero  
zero

Hole in the graph

zero  
zero

$$f(x) = \frac{1 \cdot (x+2)}{x \cdot (x+2)}$$

x=0 2 so x=0 V.A.



$f(x) = \frac{\text{Some number}}{x^n}$  then as  $x \rightarrow \infty$ ,  $f(x) \rightarrow 0$

$$f(x) = \frac{2x^3 + 3x^2 + 5}{7x^3 + 7}$$

Divide every term by largest  $x$  in denominator  
 $x^3$

$$= \frac{\frac{2x^3}{x^3} + \frac{3x^2}{x^3} + \frac{5}{x^3}}{\frac{7x^3}{x^3} + \frac{7}{x^3}}$$

$$= \frac{\frac{2}{x} + \frac{3}{x} + \frac{5}{x^3}}{7 + \frac{7}{x^3}}$$

$x \rightarrow \infty$

as  $x \rightarrow \infty$   $f(x) \rightarrow \frac{2}{7}$

Horizontal asymptote

$$y = \frac{2}{7}$$



$$y = \frac{2}{7}$$

a asymptote