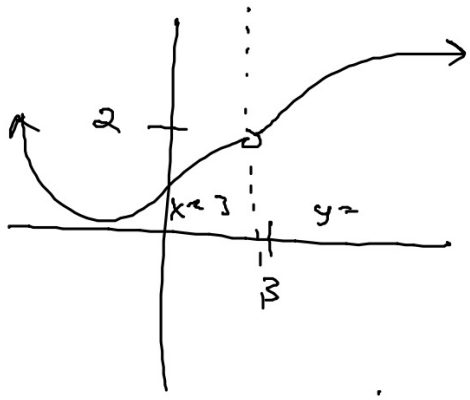
Infinite Limits

$$\lim_{x \to \infty} f(x)$$

$$\lim_{x \to \infty} \frac{\sim}{\sim} = 5$$

$\lim_{x \to \sqrt{2}^+} f(x) = \infty$ $\lim_{x \to \sqrt{2}^-} f(x) = -\infty$



Vertical Asymptote

Vertical Asympote

Occurs when the limit approaching a finite number equals $\pm\infty$.

- $\lim_{x \to c^+} f(x) = \pm\infty$

OR

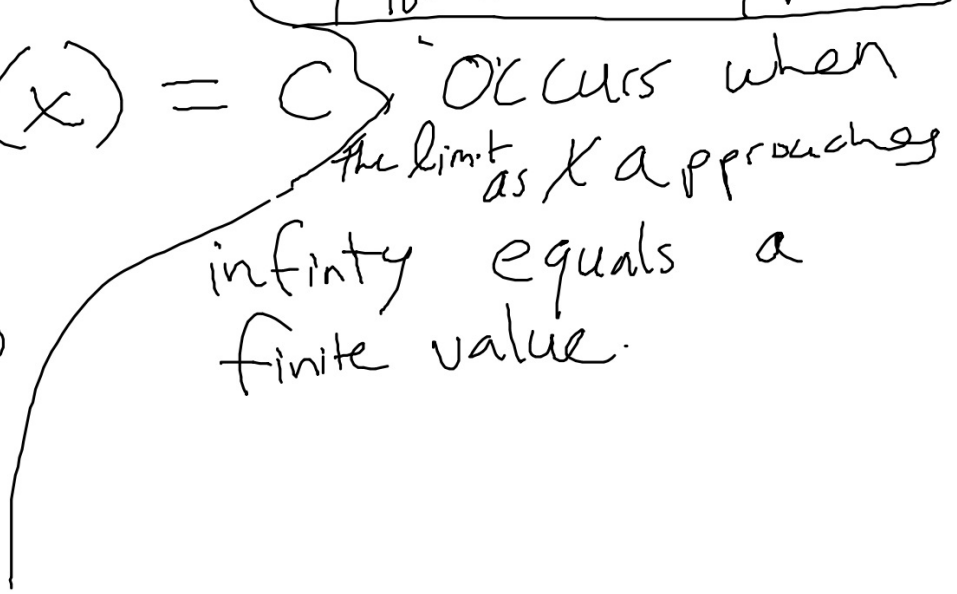
- $\lim_{x \to c^-} f(x) = \pm\infty$

Horizontal Asymptote

occurs when the limit as x approaches infinity equals a finite value.

$$\lim_{x \to \infty} f(x) = c$$

$$\lim_{x \to -\infty} f(x) = b$$



$$f(x) = \frac{3x^2 - 4x + 1}{2x^2 - 4}$$

Horizontal asympt

$$\lim_{x \to \infty} \frac{3x^2 - 4x + 1}{2x^2 - 4} = 1.5$$

$$\frac{3 \cdot \infty^2 - 4\infty + 1}{2\infty^2 - 4}$$

$$\frac{3\infty^2}{2\infty^2} = 3/2$$

How many H.A.'s can a fund have?

A) none

B.) 1

C.) 2

D) as many as we want.

Continuity at a point.

f is continuous at a point c

if: $\lim_{x \to c^-} f(x) = \lim_{x \to c^+} f(x) = f(c)$.

$$f(x)=\begin{cases} x+1, & x\geq 0 \\ x^2+1, & x<0 \end{cases}$$

Is this continuous? yes.

$f(0)=1$ $\lim_{x\to 0^+} f = 1$

$\lim_{x\to 0^-} f = 1$

p. 85

#5-7

#9-17

#29

#53-57