

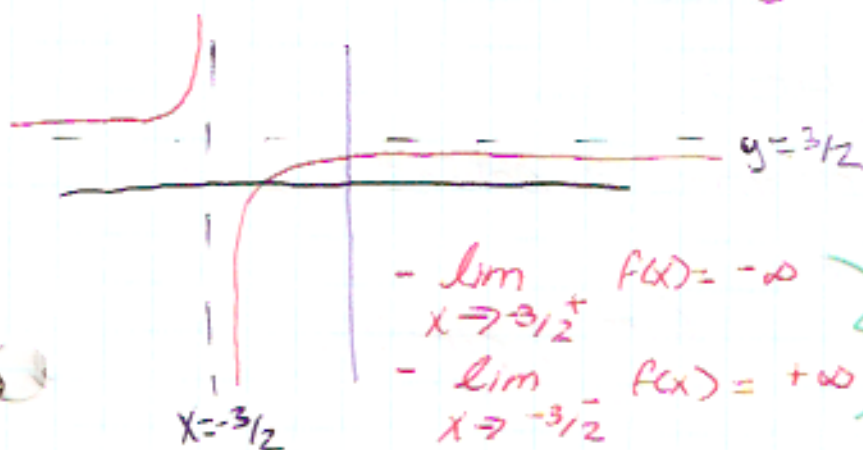
Chapter 2 - Limits

- we encounter limits in various situations when analyzing functions

→ We can determine the behaviour of a function as x approaches some finite value or as x grows without bounds

ex. let $y=f(x) = \frac{3x+2}{2x+3}$

$\text{dom}(f) = \mathbb{R} \setminus \{-3/2\}$
 $\text{ran}(f) = \mathbb{R} \setminus \{3/2\}$



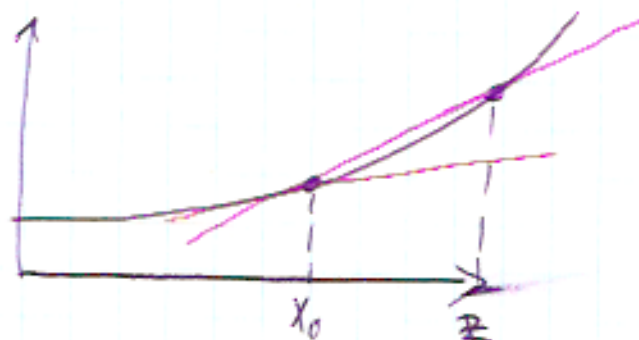
$\lim_{x \rightarrow \infty} f(x) = 3/2$
 $\lim_{x \rightarrow -\infty} f(x) = 3/2$ } for HA

$\lim_{x \rightarrow -3/2^+} f(x) = -\infty$
 $\lim_{x \rightarrow -3/2^-} f(x) = +\infty$ } for V.A

- we also encounter limits when studying the IROC of a fncn

IROC is analogous to the slope

ex.



The slope of the tangent measures the slope at the pt x_0 , IROC

(slope of secant)
 $= \frac{f(z) - f(x_0)}{z - x_0}$

[slope of tangent]
 $= \lim_{\substack{Q \rightarrow P \\ z \rightarrow x_0}} \left[\frac{f(z) - f(x_0)}{z - x_0} \right]$