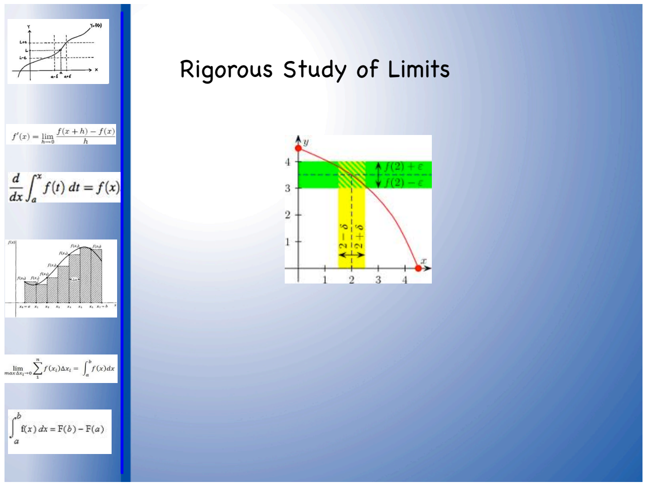
2.1 Rigorous Study of Limits

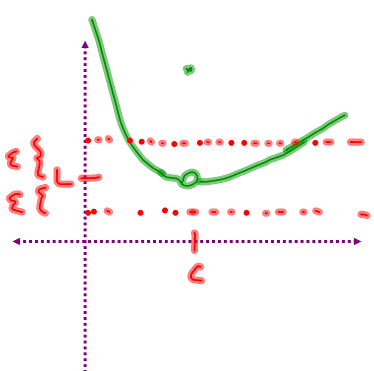


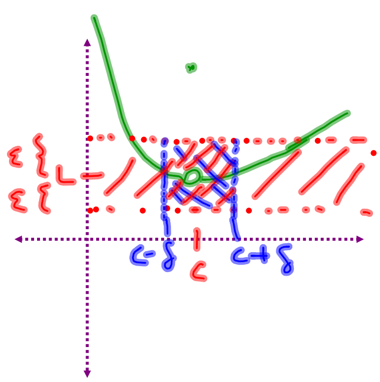
Definition

To say that $\lim_{x \to c} f(x) = L$ means that for every $\varepsilon > 0$ (no matter how small),

there exists a corresponding $\delta > 0$ such that $|f(x)-L| < \varepsilon$ provided that $0 < |x-c| < \delta$;

that is, $0 < |x-c| < \delta \Rightarrow |f(x)-L| < \varepsilon$





2.1 Rigorous Study of Limits

EX 1 Prove that $\lim_{x \to 3} (2x-5) = 1$.

EX 2 Prove that $\lim_{x \to 1} \frac{2(x-1)(x+3)}{x-1} = 8$

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EX 3 Prove that $\lim_{x \to c} \frac{1}{x-5} = \frac{1}{c-5}$ for all $c \neq 5$