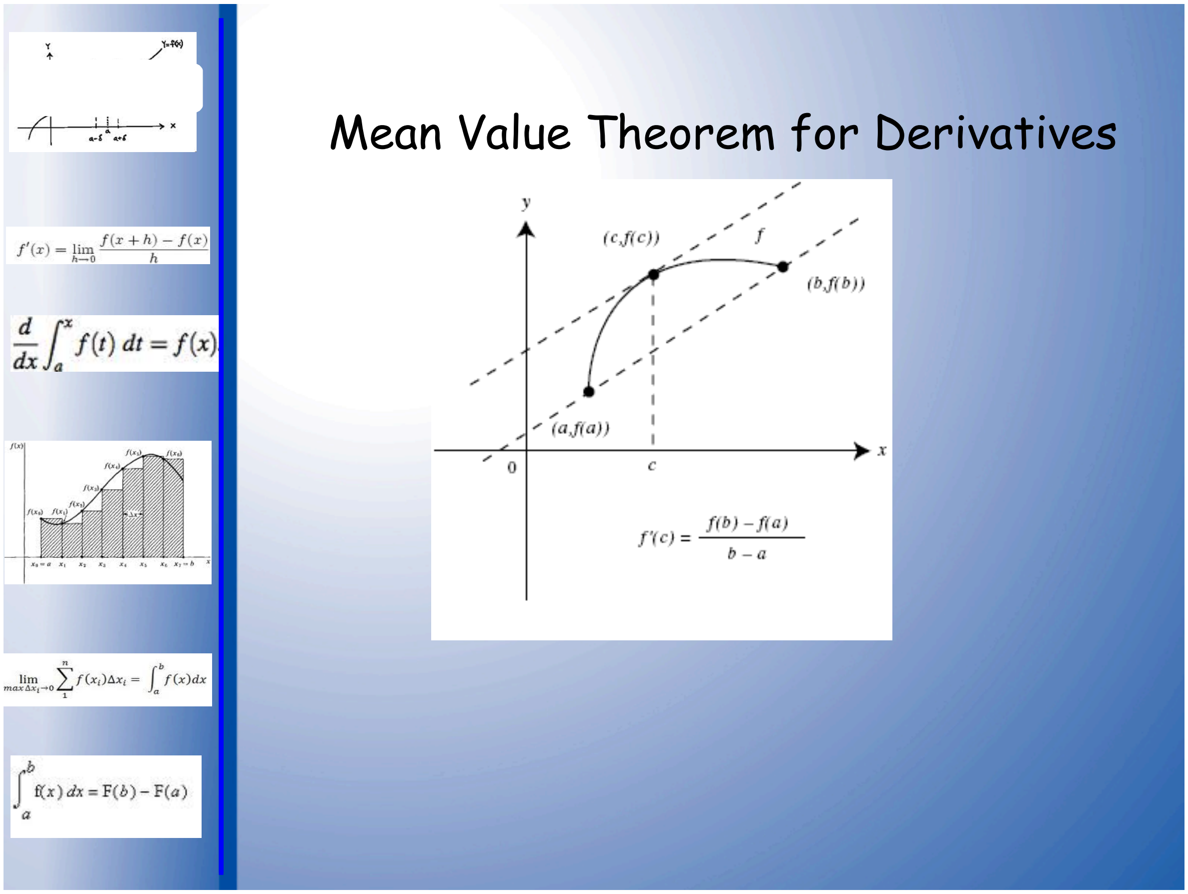
20 Mean Value Theorem



Mean Value Theorem for Derivatives

If *f* is continuous on *[a,b]* and differentiable on *(a,b),*

then there exists at least one *c* on *(a,b)* such that

$$\frac{f(b)-f(a)}{b-a}=f'(c)$$

EX 1 Find the number c guaranteed by the MVT for derivatives for

$g(x)=(x+1)^3$ on *[-1,1]*

EX 2 For $g(x)=\frac{x-4}{x-3}$, decide if we can use the MVT for derivatives on *[0,5]* or *[4,6]*. If so, find *c*. If not, explain why.

EX 3 For $f(x)=\csc x$ on $[-\pi/2,\ \pi/2]$, use the MVT for derivatives to find *c*.

20 Mean Value Theorem

<u>Theorem B</u>

If $f'(x) = g'(x)$ for all x on the interval (a,b),

then there exists a *real number, c,* such that $f(x) = g(x) + c$

for all x in the interval (a,b).