

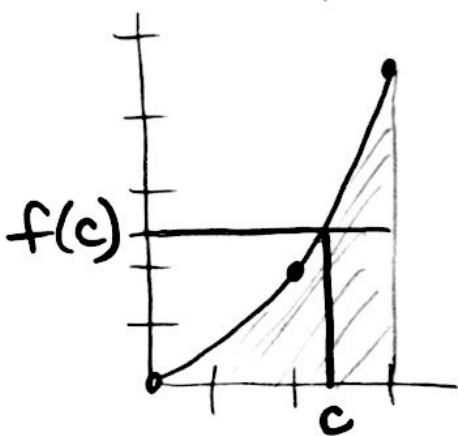
4.4 FTC Part 2

* Mean Value Theorem (for definite integrals):

If f is continuous on $[a, b]$, then at some point c in

$$[a, b], \quad f(c) = \frac{1}{b-a} \int_a^b f(x) dx$$

Visually:



Area under
 $y = \frac{1}{2}x^2 =$
Area under
 $y = \frac{3}{2}$

$$\begin{aligned} & \int_0^3 \frac{1}{2}x^2 dx \\ &= \frac{\frac{1}{2}x^3}{3} = \frac{1}{6}x^3 \Big|_0^3 \\ & \frac{27}{6} - 0 = \frac{9}{2} \end{aligned}$$

$$\text{Avg Value} = \frac{\frac{9}{2}}{3} = \frac{3}{2}$$