

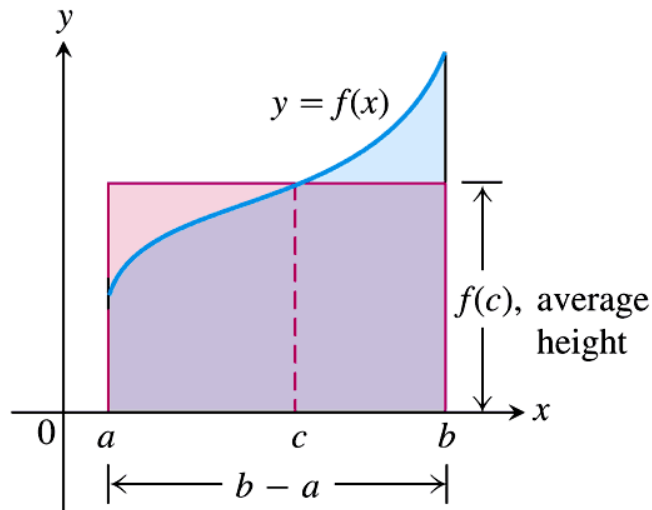


**SECTION 6.5 AVERAGE VALUE
THEOREM**
(Mean Value theorem of Integrals)

AVERAGE VALUE THEOREM

If $f(x)$ is continuous on $[a, b]$, then there exists a number c in $[a, b]$ such that

$$\int_a^b f(x) dx = f(c)[b - a]$$



To find the average value $f(c)$,

$$f(c) = \frac{1}{b - a} \int_a^b f(x) dx.$$



FIND THE AVERAGE Y VALUE

1. $f(x) = 4 - x^2$ on $[0, 3]$

$$\frac{1}{3-0} \int_0^3 4 - x^2 dx = 1$$

2. $f(x) = \sqrt{x}$ on $[0, 4]$

$$\frac{1}{4-0} \int_0^4 \sqrt{x} dx = \frac{4}{3}$$



- A plane flies in a straight line with $v(t)$ in miles/min

t	0	5	10	15	20	25	30	35	40
$V(t)$	7	9.2	9.5	7.0	4.5	2.4	2.4	4.3	7.3

- Find average velocity of the plane in the first 40 minutes of flight using trapezoidal approximation.

