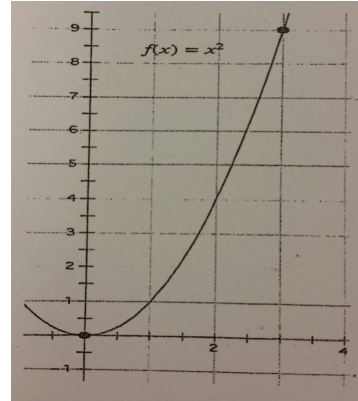


5.3.2

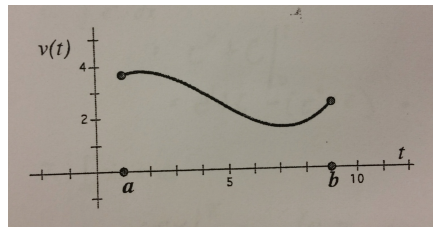
5.3.2 Average Value of a Function

What do we mean by the average value of a function?

Think about the average value of $f(x) = x^2$ over $[0,3]$



What about the average value of a velocity graph? (The average velocity)

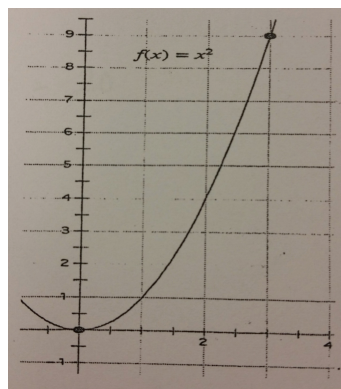


Write a formula:

The formula applies to the average value of all functions

5.3.2

Now find the average value of $f(x) = x^2$ over $[0,3]$



Will $f(x) = x^2$ ever equal its average value over $[0,3]$?
Where?

Will there always be an $x=c$ in $[a,b]$ such that $f(c)$ is the average value of the function over $[a,b]$? Under what conditions?

What theorem does this sound like?

Theorem:

RS #27

5.3.2

Find the average value of each function over the given interval. At what x-value does the function take on its average value?

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

2. $f(x) = (x + 2)^2$, $[-1, 1]$

5.3.2

3. $g(x) = x^3 + 1, [1, 4]$

4. $h(x) = e^{2x}, [0, \ln 2]$ (Check using calc)

5.3.2

Comparisons between Mean Value Theorems

MVT for derivatives	MVT for integrals
Average rate of change	Average value of function
Derivative $f'(x)$	$f(x)$
Set them =	Set them =
Solve	Solve