

# WHY DID THE INTEGRAL GROUP OF ELITE

## PHILANTHROPISTS REJECT $\frac{1}{b-a} \int_a^b f(x) dx$ ?

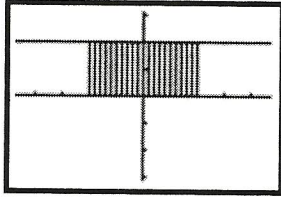
### The Mean Value Theorem for Integrals

To find the mean value of a continuous function on interval  $[a, b]$

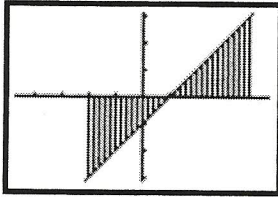
$$f_{\text{ave}}(x) = \frac{1}{b-a} \int_a^b f(x) dx$$

Find a) the minimum value b) the maximum value and  
c) the average value of the given function on the given interval.

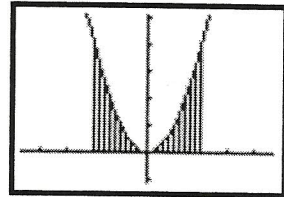
1)  $f(x) = 2; [-2, 2]$



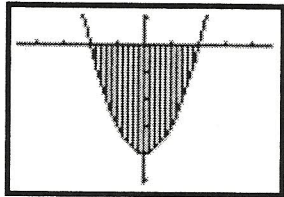
2)  $f(x) = x - 1; [-2, 4]$



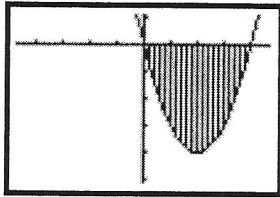
3)  $f(x) = x^2; [-2, 2]$



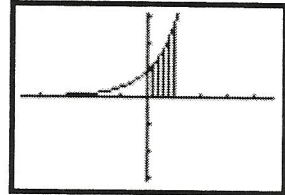
4)  $f(x) = x^2 - 4; [-2, 2]$



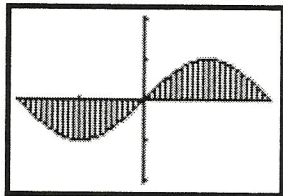
5)  $f(x) = x^2 - 4x; [0, 4]$



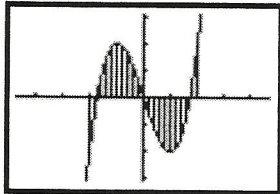
6)  $f(x) = e^x; [0, 1]$



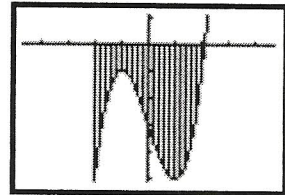
7)  $f(x) = \sin(x); [-\pi, \pi]$



8)  $f(x) = x^3 - 3x; [-2, 2]$



9)  $f(x) = x^3 - 3x - 3; [-2, 2]$



- 10) If  $f(x)$  is odd, then the average value of  $f(x)$  over the interval  $[-b, b]$  is?  
11) If the average value of  $f(x)$  over the interval  $[b, c]$  is  $a$ , then the average value of  $f(x) - k$  is?

Values.

A. 0	B. 3	C. -2	D. 4	E. 2	E. -3	G. -5	H. 1
M. e	N. -1	R. $e-1$	S. -4	U. $a-k$	V. $\frac{4}{3}$	W. $-\frac{8}{3}$	Y. $-\frac{4}{3}$

2b	8b	8a	7c	11	4a	1a

6a	1b

5c	8c	5a

6b	2a	4b	9b

3a	7a	3b

7b	9c

4c	5b	5a

10	3c	8b	6c	2c	9a	1c