AP CALCULUS

Area Approximation – Riemann Sums and Trapezoid Rule

1. If $f(x)$ is a continuous function for all x, given selected values of f below, approximate $\int_1^8 f(x)dx$ using the trapezoid method.

x	0	1	3	6	6.6	8	10
$f(x)$	4	3	3	1	5	8	10

2. The table below give the values of a function obtained from an experiment. Use them to estimate $\int_0^6 f(x)dx$ using three equal subintervals.

x	0	1	3	3	4	5	6
$f(x)$	9.3	9.0	8.3	6.5	2.3	-7.6	-10.5

A. Use left endpoint approximation.

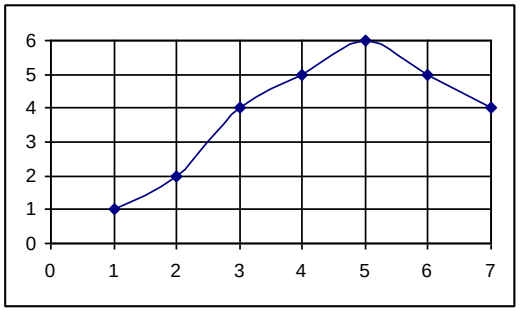
B. Use right endpoint approximation.

C. If the function is said to be decreasing function, can you say whether your estimates from A and B are less than or greater than the exact value of the integral?

3. The graph of the function f over the interval [1,7] is shown. Using values from the graph, find the trapezoidal rule estimates for the integral $\int_1^7 f(x)dx$ by using the indicated number of subintervals.

A. n = 3

B. n = 6



4. Find $\int_0^5 f(x)dx$ if $f(x) = \begin{cases} 3, x < 3 \\ x, x \geq 3 \end{cases}$. (Hint: Sketch the graph and interpret the areas)