DATE: _____

Definite Integral & Reimann AP M/C Practice

		$\Delta t=3$	$\Delta t=5$	$\Delta t=3$
t (hours)	4	7	12	15
$R(t)$ (liters/hour)	6.5	6.2	5.9	5.6

right

1. A tank contains 50 liters of oil at time $t = 4$ hours. Oil is being pumped into the tank at a rate $R(t)$, where $R(t)$ is measured in liters per hour, and t is measured in hours. Selected values of $R(t)$ are given in the table above. Using a right Riemann sum with three subintervals and data from the table, what is the approximation of the number of liters of oil that are in the tank at time $t = 15$ hours?

(A) 64.9 (B) 68.2 **(C) 114.9** (D) 116.6 (E) 118.2

right Riemann Sum $= 3(5.6) + 5(5.9) + 3(6.2)$

$= 64.9$ (hr)(liters/hr)

$= 64.9$ liters

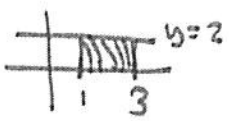
start w/ 50 liters, so $50 + 64.9 =$ **114.9**

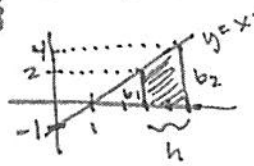
2. The function f is defined by $(x) = \begin{cases} 2 & \text{for } x < 3 \\ x - 1 & \text{for } x \geq 3 \end{cases}$. What is the value of $\int_1^5 f(x)dx$?

(A) 2 (B) 6 (C) 8 **(D) 10** (E) 12

$$\int_1^5 f(x)dx = \int_1^3 f(x)\,dx + \int_3^5 f(x)\,dx$$

$$= \int_1^3 2\,dx + \int_3^5 (x-1)\,dx$$





$f(3) = 3 - 1 = 2$

$f(5) = 5 - 1 = 4$

$A_{trap} = \frac{1}{2}(b_1 + b_2)h$

$= 2(2) + \frac{1}{2}(2+4)(2)$

$= 4 + \frac{1}{2}(6)(2)$

$= 4 + 6$

$= 10$