DATE: ____________

Riemann Sums M/C & FRQ Practice

t (hours)	4	7	12	15
$R(t)$ (liters/hour)	6.5	6.2	5.9	5.6

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

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2. A function f is continuous on [1,5] and some of the values of f are shown below:

x	1	4	5
$f(x)$	7	b	2

If the right Riemann sum is 17, then the value of b is:

(A) –4 **(B)** 0 **(C)** 3 **(D)** 4.25 **(E)** 5

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3. The rate of temperature of water in a tub at time t is modeled by a strictly decreasing, twice-differentiable function $W'(t)$, where $W'(t)$ is measured in degrees Fahrenheit per minute and t is measure in minutes. For $0 \le t \le 20$, use a left Riemann sum with the four subintervals indicated by the data in the table to approximate the temperature of the water over these 20 minutes. Does this approximation overestimate or underestimate the actual temperature of the water?

t (minutes)	0	4	9	15	20
$W'(t)$ (°F/min)	12.1	9.7	6.1	3.1	2.3