4. [10 points] Gabe the mouse is swimming alone in a very large puddle of water. He keeps track of his swimming time by logging his velocity at various points in time. Gabe starts at a point on the edge of the puddle and swims in a straight line with increasing speed. A table of Gabe's velocity $V(t)$, in feet per second, t seconds after he begins swimming is given below.

t	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
$V(t)$	0	0.3	0.4	0.45	0.9	1.2	1.8	2.4	2.7	2.9	3	3.2	3.5

a. [3 points] Give a practical interpretation of the integral $\int_1^{5.5} V(t)\,dt$ in the context of the problem. Be sure to include units.

b. [3 points] Estimate $\int_1^{5.5} V(t)\,dt$ by using a right-hand Riemann sum with 3 equal subdivisions. Make sure to write down all terms in your sum.

Answer: _____

c. [1 point] Is your estimate from above an overestimate or an underestimate of the exact value of $\int_1^{5.5} V(t)\,dt$? Circle your answer.

OVERESTIMATE UNDERESTIMATE NOT ENOUGH INFORMATION

d. [3 points] Suppose Gabe wants to use a Riemann sum to calculate how far he traveled between $t = 1$ and $t = 5.5$, accurate to within 0.15 feet. How many times would he have to measure his velocity in this interval in order to achieve this accuracy? Justify your answer.

Answer: _____