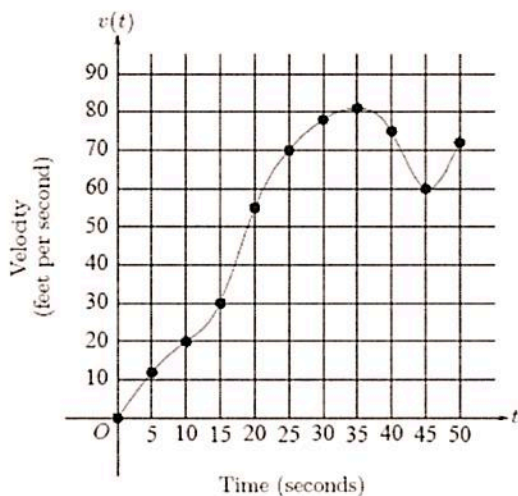


Name: \_\_\_\_\_  
AP Calculus AB

Date: \_\_\_\_\_  
Ms. Loughran

1998 AP Calculus AB Free-Response Questions



$t$ (seconds)	$v(t)$ (feet per second)
0	0
5	12
10	20
15	30
20	55
25	70
30	78
35	81
40	75
45	60
50	72

3. The graph of the velocity  $v(t)$ , in ft/sec, of a car traveling on a straight road, for  $0 \leq t \leq 50$ , is shown above. A table of values for  $v(t)$ , at 5 second intervals of time  $t$ , is shown to the right of the graph.
- During what intervals of time is the acceleration of the car positive? Give a reason for your answer.
  - Find the average acceleration of the car, in  $\text{ft}/\text{sec}^2$ , over the interval  $0 \leq t \leq 50$ .
  - Find one approximation for the acceleration of the car, in  $\text{ft}/\text{sec}^2$ , at  $t = 40$ . Show the computations you used to arrive at your answer.
  - Approximate  $\int_0^{50} v(t) dt$  with a Riemann sum, using the midpoints of five subintervals of equal length. Using correct units, explain the meaning of this integral.