2008 AP® CALCULUS AB FREE-RESPONSE QUESTIONS

t (hours)	0	1	3	4	7	8	9
L(t) (people)	120	156	176	126	150	80	0

- 2. Concert tickets went on sale at noon (t = 0) and were sold out within 9 hours. The number of people waiting in line to purchase tickets at time t is modeled by a twice-differentiable function L for $0 \le t \le 9$. Values of L(t) at various times t are shown in the table above.
 - (a) Use the data in the table to estimate the rate at which the number of people waiting in line was changing at 5:30 P.M. (t = 5.5). Show the computations that lead to your answer. Indicate units of measure.
 - (b) Use a trapezoidal sum with three subintervals to estimate the average number of people waiting in line during the first 4 hours that tickets were on sale.
 - (c) For $0 \le t \le 9$, what is the fewest number of times at which L'(t) must equal 0 ? Give a reason for your answer.
 - (d) The rate at which tickets were sold for $0 \le t \le 9$ is modeled by $r(t) = 550te^{-t/2}$ tickets per hour. Based on the model, how many tickets were sold by 3 P.M. (t = 3), to the nearest whole number?

WRITE ALL WORK IN THE PINK EXAM BOOKLET.