

Verbal:	Table:																
2008 AP Calculus AB Free-Response (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 $0 \leq t \leq 9$. <div style="text-align: center;">€ € €</div>	Values of $t = 0$ shown at various times t . <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="padding: 2px 5px;">t (hours)</th> <th style="padding: 2px 5px;">0</th> <th style="padding: 2px 5px;">1</th> <th style="padding: 2px 5px;">3</th> <th style="padding: 2px 5px;">4</th> <th style="padding: 2px 5px;">7</th> <th style="padding: 2px 5px;">8</th> <th style="padding: 2px 5px;">9</th> </tr> <tr> <th style="padding: 2px 5px;">$L(t)$ (people)</th> <td style="padding: 2px 5px;">120</td> <td style="padding: 2px 5px;">156</td> <td style="padding: 2px 5px;">176</td> <td style="padding: 2px 5px;">126</td> <td style="padding: 2px 5px;">150</td> <td style="padding: 2px 5px;">80</td> <td style="padding: 2px 5px;">0</td> </tr> </table> €	t (hours)	0	1	3	4	7	8	9	$L(t)$ (people)	120	156	176	126	150	80	0
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Graph:	Analysis:
	1. Use the data in the table to estimate the rate at which the number of people waiting in line was changing at 5:30 PM. <ol style="list-style-type: none"> a. What does t equal at 5:30 PM? b. What units is this rate measured in, what does it mean? c. Estimate. 2. For $0 \leq t \leq 9$, what is the fewest number of times at which $L'(t)$ must equal 0? <ol style="list-style-type: none"> a. What is happening to the line when $L'(t) = 0$? € b. When is $L(t)$ increasing? € c. What real-world factors do you suspect influence when $L(t)$ decreases? € €

“Who was not amazed to learn that the function $y = e^x$, like a phoenix rising again from its own ashes, is its own derivative?” – Francois le Lionnais
Nationality: French Born: October 3, 1901 Died: March 13, 1984