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| **Topic 5: Calculus**  | **Critical Points** |
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| 1. A math teacher has a son, Dennis, who plays little league baseball and came up with a great idea for a problem while watching a game last Saturday. She modelled an equation based off of one of Dennis’s hits:

 , Where is the height of the ball in meters, is the length of time in seconds, and represents the moment Dennis hit the ball. |
| * 1. What is the height, off the ground, from which the ball is hit?
	2. Find the height of the ball after 3 seconds
	3. The ball lands after seconds, find
	4. Find
	5. (i) When is the ball at its maximum height?(ii) Find the maximum height of the ball.
 | (1 mark)(2 marks)(2 marks)(2 marks)(2 marks)(2 marks) |
| Mark scheme:1. 1.5 m
2. m
3. Solving for using the calculator, quadratic formula, etc seconds
4.
5. (i)  seconds (ii)  m
 | (A1)(M1)(A1)(M1)(A1)(A1)(A1)(M1) ft Setting their derivative = 0(A1) ft(M1) ft Plugging in their (e)(i) value(A1) ft |