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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 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 | |