2. The fixed points A, B and C lie in a straight line on a horizontal road.

- At time $t = 0$, a motorbike passes through A with speed $5\,\text{m s}^{-1}$
- From A, the motorbike accelerates uniformly until it reaches B with a speed of $V\,\text{m s}^{-1}$
- The motorbike takes T_1 seconds to travel from A to B
- From B, the motorbike decelerates uniformly until it comes to rest at C
- The motorbike takes T_2 seconds to travel from B to C

(a) Sketch a speed-time graph for the motion of the motorbike as it moves from A to C.

(3)

The distance AB is 132 m and the distance BC is 136 m.

(b) Find, in terms of V, an expression for

(i) T_1

(ii) T_2

(4)

Given that the motorbike takes 28 s to travel from A to C,

(c) find the value of V,

(2)

(d) find the deceleration of the motorbike.

(2)

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Question 2 continued

(Total for Question 2 is 11 marks)