2 **(a)** Car A is traveling along a straight path at a constant speed of 8.5 m s^{-1}. When car A passes car B at $t = 0$ s, car B accelerates uniformly from rest at 2.5 m s^{-2}.

(i) Determine the distance travelled by car B when it overtakes car A.

distance = ………………………… m [2]

(ii) On Fig. 2.1, sketch a well labelled graph to show the variation with time of the displacement of car A and car B.

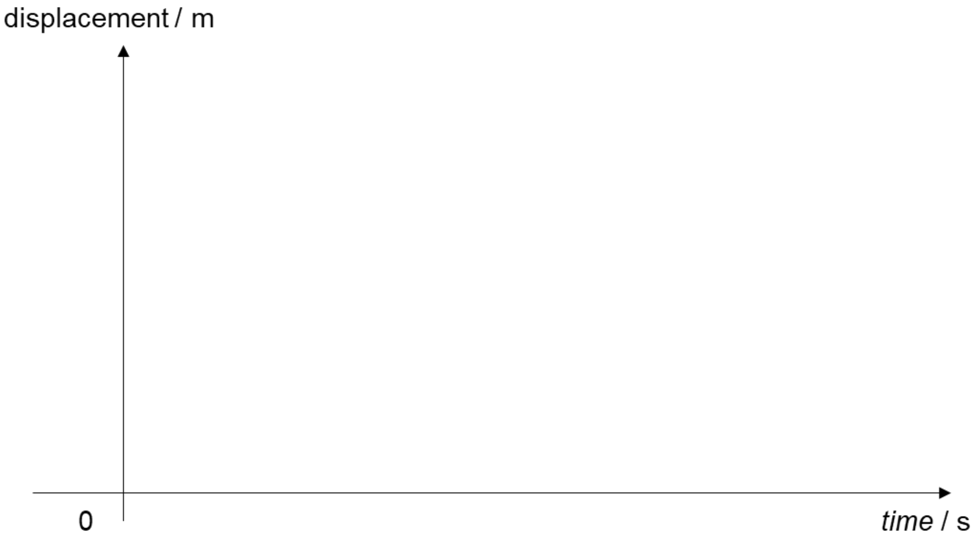

Fig. 2.1

[2]

(b) After overtaking car A, car B is traveling at a speed of 11.5 m s^{-1} just before it falls off a cliff of height 6.5 m. The effect of air resistance is negligible.

(i) Determine the angle *θ* car B makes with the horizontal just before it hits the ground.

θ = ………………………… ° [2]

(ii) Car A subsequently falls off the same cliff as car B.

State and explain how the angle it makes with the horizontal will differ, if any, with that of car B found in **(b)(i)**.

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[Total: 8]