

A cyclist starts from rest at a fixed point O and moves in a straight line, before coming to rest k seconds later. The acceleration of the cyclist at time t s after leaving O is $a \text{ m s}^{-2}$, where $a = 2t^{-\frac{1}{2}} - \frac{3}{5}t^{\frac{1}{2}}$ for $0 < t \leq k$.

(a) Find the value of k . [4]

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(b) Find the maximum speed of the cyclist. [3]

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- (c) Find an expression for the displacement from O in terms of t . Hence find the total distance travelled by the cyclist from the time at which she reaches her maximum speed until she comes to rest. [4]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.