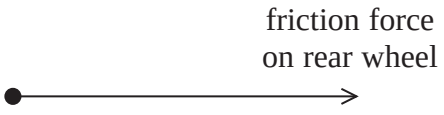
**12** The photograph shows a cyclist cycling at a constant velocity on horizontal ground.

(a) Complete the free-body force diagram to show the four forces acting on the bicycle. Treat the bicycle and cyclist as a single object. One force has been added for you.

**(3)**

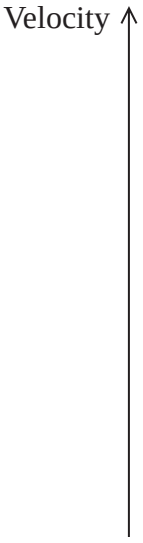



(b) The cyclist stops pedalling and comes to rest in a time of 5.2 s.

(i) Sketch a graph to show how the cyclist's velocity changes during this time.

Assume the deceleration is constant.

**(2)**




(ii) The cyclist travels 7.80 m while coming to rest.

Calculate the average resistive force on the cyclist and bicycle.

mass of cyclist and bicycle = 28.0 kg

**(4)**

Average resistive force = .....

**(Total for Question 12 = 9 marks)**