10 A cyclist starts from rest and moves with constant acceleration along a straight horizontal road. The cyclist reaches a speed of $6\,\text{m s}^{-1}$ in 25 seconds. The cyclist then moves with constant acceleration $0.05\,\text{m s}^{-2}$ until the speed is $10\,\text{m s}^{-1}$. The cyclist then moves with constant deceleration until coming to rest. The total time for the cyclist's journey is 150 seconds.

(a) Sketch a velocity-time graph to represent the cyclist's motion. **[2]**

(b) Find the acceleration during the first 25 seconds of the cyclist's motion. **[1]**

The cyclist takes T seconds to decelerate from $10\,\text{m s}^{-1}$ until coming to rest.

(c) Determine the value of T. **[2]**

(d) Determine the average speed for the cyclist's journey. **[3]**