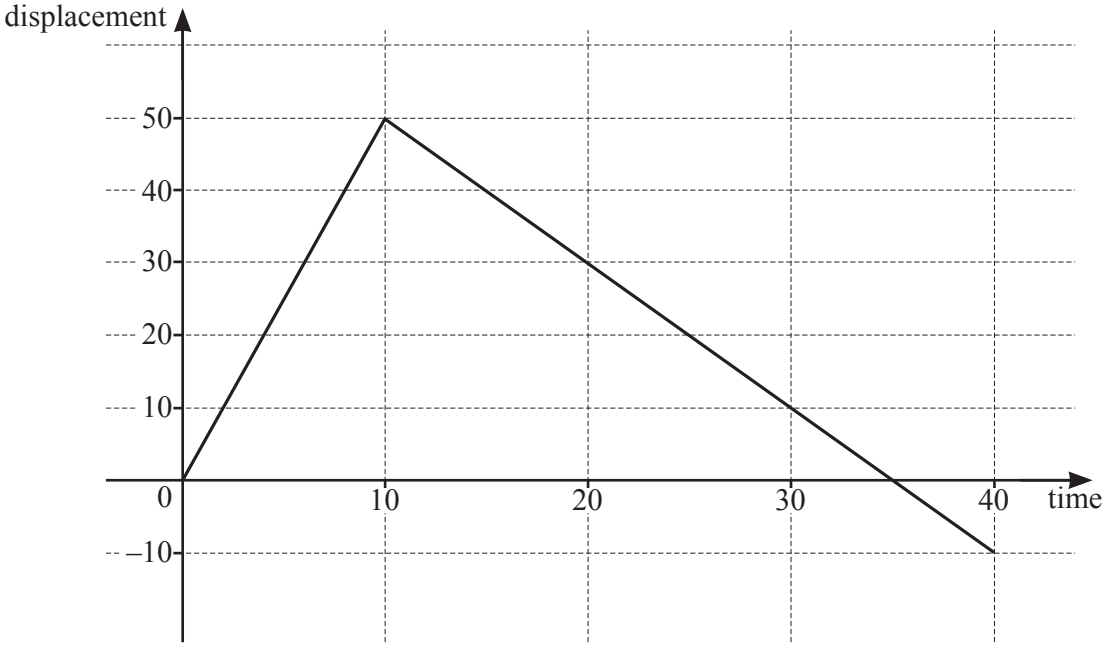
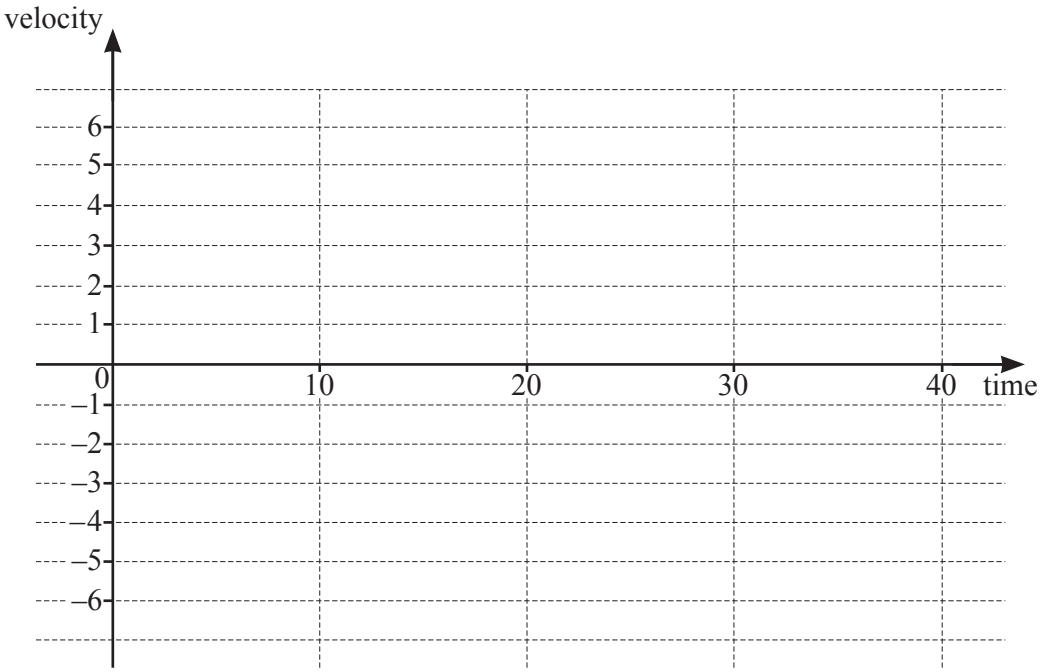
7 **(a)** In this question, all lengths are in metres and time, t, is in seconds.



The diagram shows the displacement–time graph for a runner, for $0 \leqslant t \leqslant 40$.

(i) Find the distance the runner has travelled when $t = 40$. [1]

(ii) On the axes, draw the corresponding velocity–time graph for the runner, for $0 \leqslant t \leqslant 40$. [2]



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(b) A particle, P, moves in a straight line such that its displacement from a fixed point at time t is s.

The acceleration of P is given by $\left(2t+4\right)^{-\frac{1}{2}}$, for $t > 0$.

(i) Given that P has a velocity of 9 when $t = 6$, find the velocity of P at time t. [3]

(ii) Given that $s = \frac{1}{3}$ when $t = 6$, find the displacement of P at time t. [3]