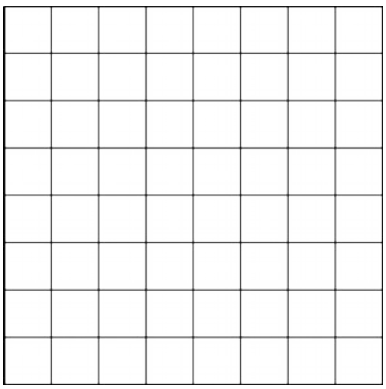
Motion graphs – Practice

1. The table shows data for standing-start acceleration for a car.

t (s)	0	5	10	15	20	25	30	35	40
v (m/s)	0	14	24	30	34	37	39	40	40

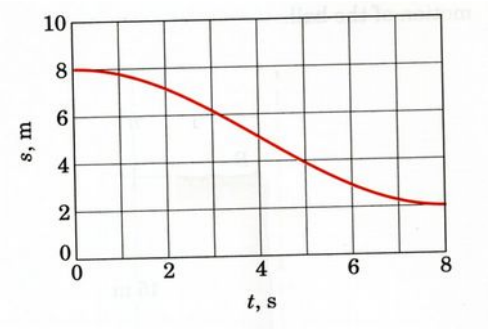
(a) Plot the velocity-time graph on the grid at the right.



(b) Use the graph to calculate:
   (i) the displacement of the car when it has reached a speed of 25 m/s
   (ii) the acceleration of the car when its speed is 30 m/s
   (iii) the maximum acceleration of the car

(150 m, 0.96 m/s^2, 3.0 m/s^2)

2. The graph shows how the displacement of a particle varies with time.



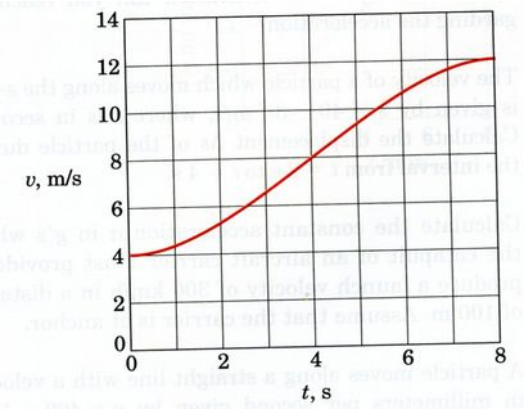
Calculate:

(a) the average velocity during the 8 s,

(b) the instantaneous velocity when t = 4 s.

(–0.75 m/s, –1.25 m/s)

3. The graph shows how the velocity of a particle varies with time.



Calculate:

(a) the displacement during the 8 s,

(b) the average acceleration during the 8 s,

(b) the acceleration at time t = 4 s.

(64 m, 1.0 m/s^2, 1.5 m/s^2)