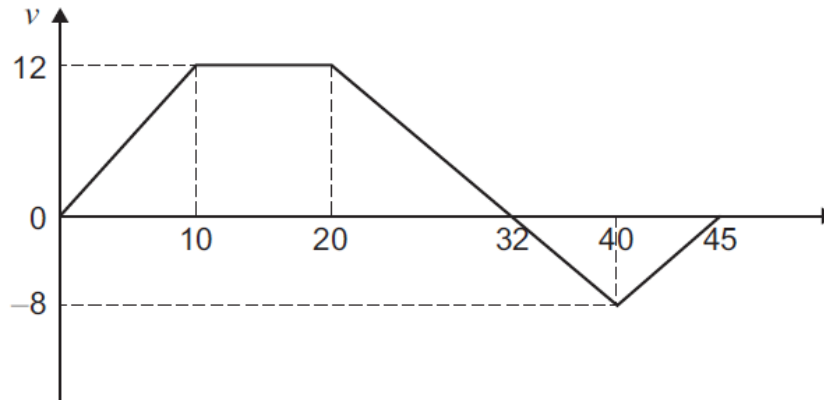


AQA – Kinematics – AS Mathematics P1**1. June/2021/Paper_7356/1/No.13**

A car, initially at rest, is driven along a straight horizontal road.

The graph below is a simple model of how the car's velocity, v metres per second, changes with respect to time, t seconds.



- (a) Find the displacement of the car when $t = 45$

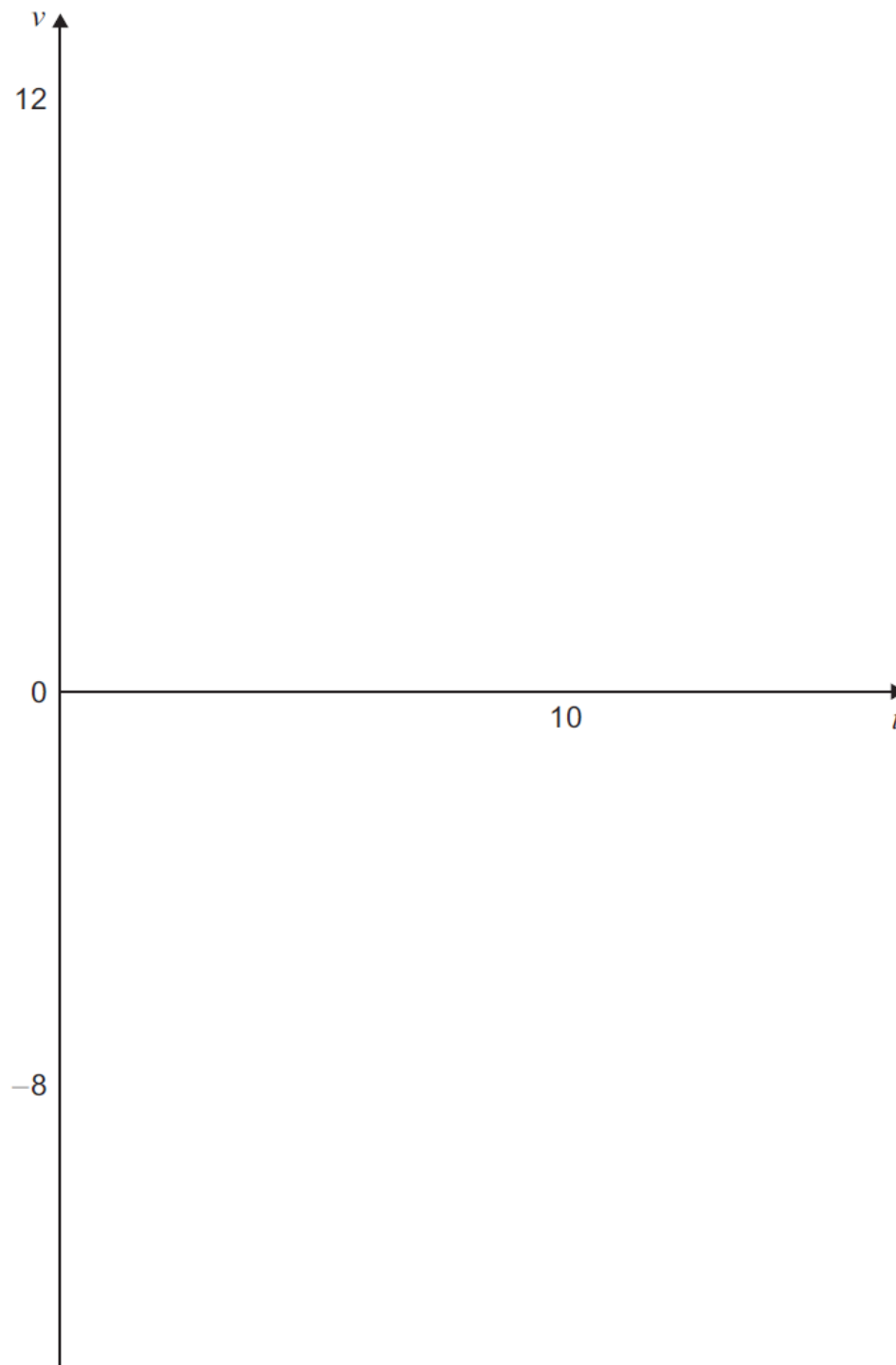
[3 marks]

(b) Shona says:

“This model is too simple. It is unrealistic to assume that the car will instantaneously change its acceleration.”

On the axes below sketch a graph, for the first 10 seconds of the journey, which would represent a more realistic model.

[2 marks]



2. June/2021/Paper_7356/1/No.14

A particle, P, is moving along a straight line such that its acceleration $a \text{ m s}^{-2}$, at any time, t seconds, may be modelled by

$$a = 3 + 0.2t$$

When $t = 2$, the velocity of P is $k \text{ m s}^{-1}$

- (a) Show that the initial velocity of P is given by the expression $(k - 6.4) \text{ m s}^{-1}$ [4 marks]

- (b) The initial velocity of P is one fifth of the velocity when $t = 2$

Find the value of k .

[2 marks]