

Practice Questions: v-t graphs

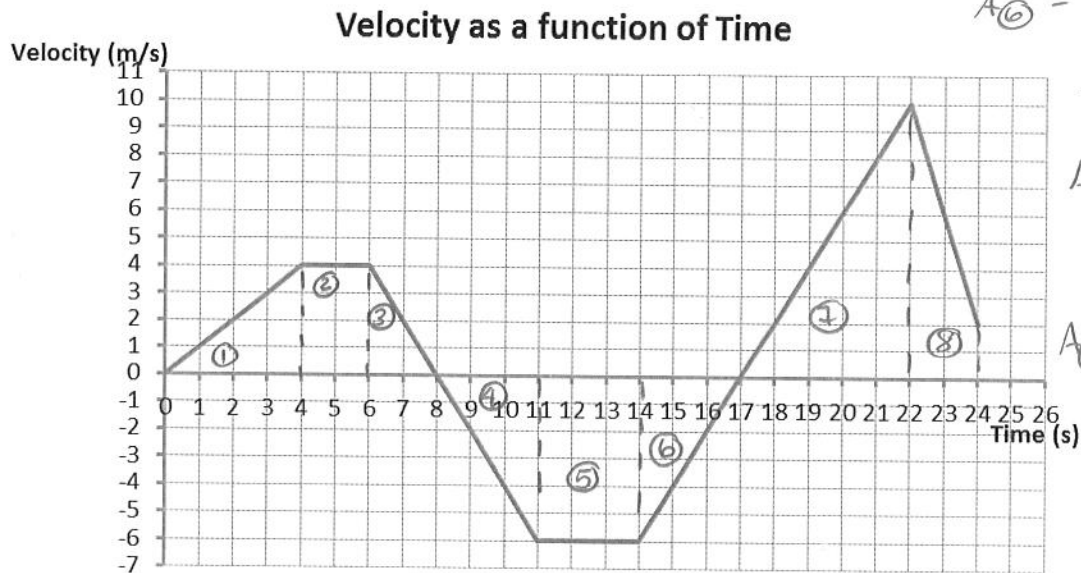
Consider the graph below.

$$A_5 = \frac{3s \times -6m/s}{2} = -9m$$

$$A_6 = \frac{3s \times -6m/s}{2} = -9m$$

$$A_7 = \frac{5s \times 10m/s}{2} = 25m$$

$$A_8 = \frac{(2m/s + 10m/s) \times 2}{2} = 12m$$



$$A_1 = \frac{4s \times 4m/s}{2} = 8m$$

$$A_2 = \frac{2s \times 4m/s}{2} = 4m$$

$$A_3 = \frac{2s \times 4m/s}{2} = 4m$$

$$A_4 = \frac{3s \times -6m/s}{2} = -9m$$

1) What is the velocity at 5.0 s? $4.0m/s$

2) What is the velocity at 10.0 s? $-4.0m/s$

3) What is the acceleration at 8.0 s?

$$a = \text{slope} = \frac{-4m/s - 0}{10s - 8s} = \frac{-4m/s}{2s} = -2m/s^2$$

4) What is the acceleration at 13.0 s?

0 (constant velocity)

5) What is the acceleration at 16.0 s?

$$a = \text{slope} = \frac{6m/s - 0}{20s - 17s} = \frac{6m/s}{3s} = 2m/s^2$$

6) What is the average acceleration from 3.0 s to 22.0 s?

$$a_{av} = \frac{v_f - v_i}{\Delta t} = \frac{10m/s - 3m/s}{19s} = \frac{7m/s}{19s} = 0.37m/s^2$$

7) What is the distance traveled from 0.0 s to 14.0 s?

$$\text{distance} = 8m + 8m + 4m + 9m + 18m = 47m$$

8) What is the displacement from 0.0 s to 14.0 s?

$$\Delta d = 8m + 8m + 4m + (-9m) + (-18m) = -7m$$

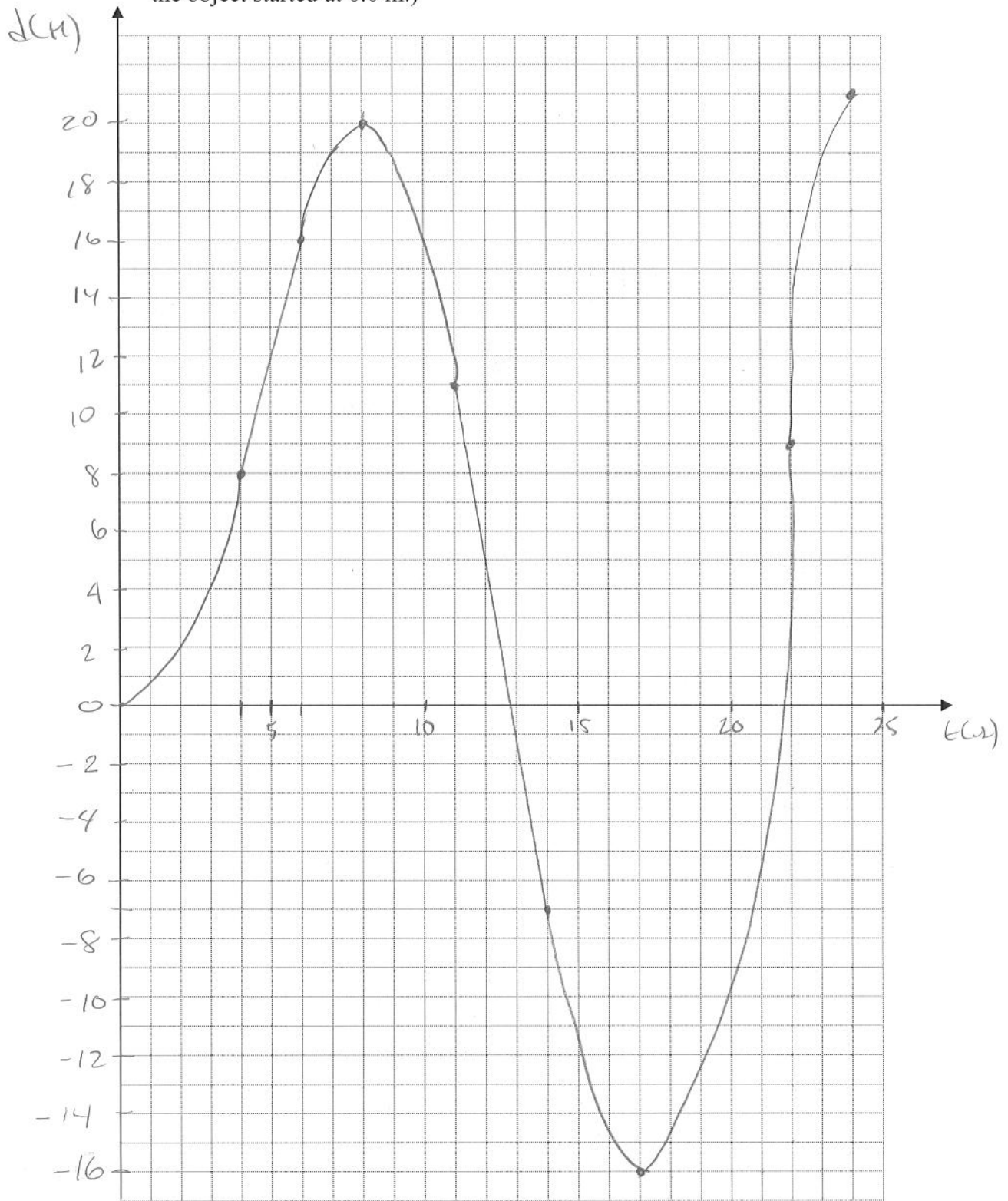
9) What is the average velocity from 14.0 s to 24.0 s?

$$v_{av} = \frac{\Delta d}{\Delta t} = \frac{-9m + 25m + 12m}{10s} = \frac{28m}{10s} = 2.8m/s$$

10) What is the average speed from 14.0 s to 24.0 s?

$$\text{Speed}_{av} = \frac{\text{distance}}{\Delta t} = \frac{9m + 25m + 12m}{10s} = \frac{46m}{10s} = 4.6m/s$$

- 11) Draw the d-t graph that corresponds to the given velocity-time graph. (Assume the object started at 0.0 m.)



- 12) Draw the a-t graph that corresponds to the given velocity-time graph.

