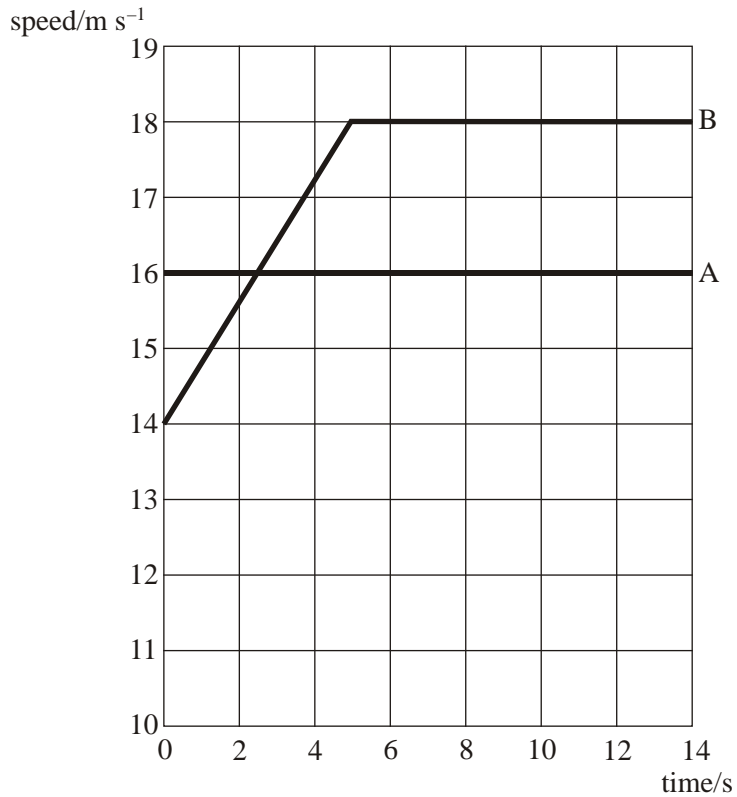


Chapter 8 Past Paper Questions

1. The graph represents the motion of two cars, A and B, as they move along a straight, horizontal road.



- (a) Describe the motion of each car as shown on the graph.

- (i) car A:
-
- (ii) car B:
-

(3)

- (b) Calculate the distance travelled by each car during the first 5.0 s.

- (i) car A:
-
-
- (ii) car B:
-
-

(4)

(Total 7 marks)

2. The Thrust SSC car raised the world land speed record in 1997. The mass of the car was 1.0×10^4 kg. A 12s run by the car may be considered in two stages of constant acceleration. Stage one was from 0 to 4.0 s and stage two 4.0 s to 12 s.

(i) In stage one the car accelerates from rest to 44 m s^{-1} in 4.0 s. Calculate the acceleration produced and the force required to accelerate the car.

.....
.....
.....
.....

(ii) In stage two the car continued to accelerate so that it reached 280 m s^{-1} in a further 8.0 s. Calculate the acceleration of the car during stage two.

.....
.....

(iii) Calculate the distance travelled by the car from rest to reach a speed of 280 m s^{-1} .

.....
.....

(Total 6 marks)

3. (a) (i) Define acceleration.

.....

(ii) State why acceleration is a vector quantity.

.....
.....

(2)

(b) State what feature of a velocity-time graph may be used to calculate

(i) acceleration,

.....

(ii) displacement.

.....

(2)

- (c) The graph in **Figure 1** shows how the displacement of a runner from a fixed point, along a straight track, varies with time.

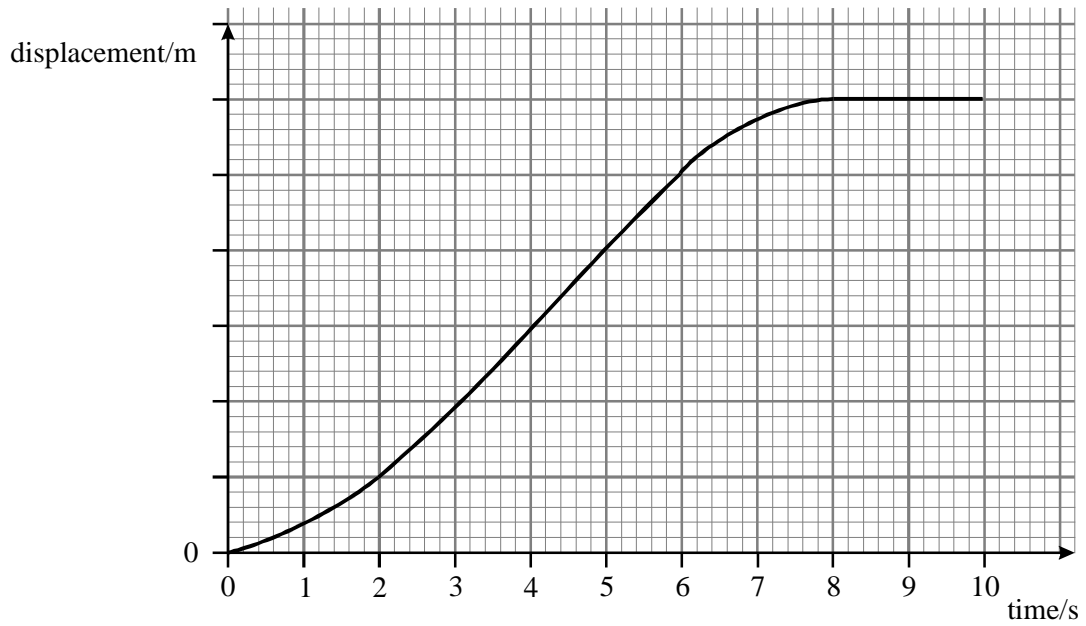


Figure 1

Without calculation, sketch on the grid in **Figure 2** a graph to show how the velocity of the same runner varies over the same period. The time scales are the same on both graphs.

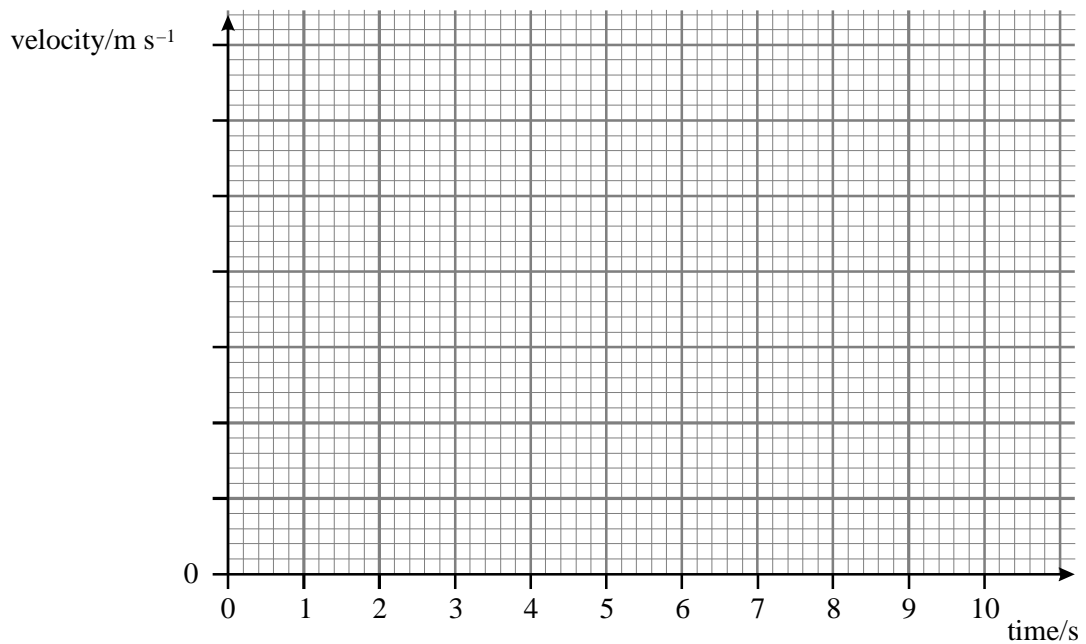
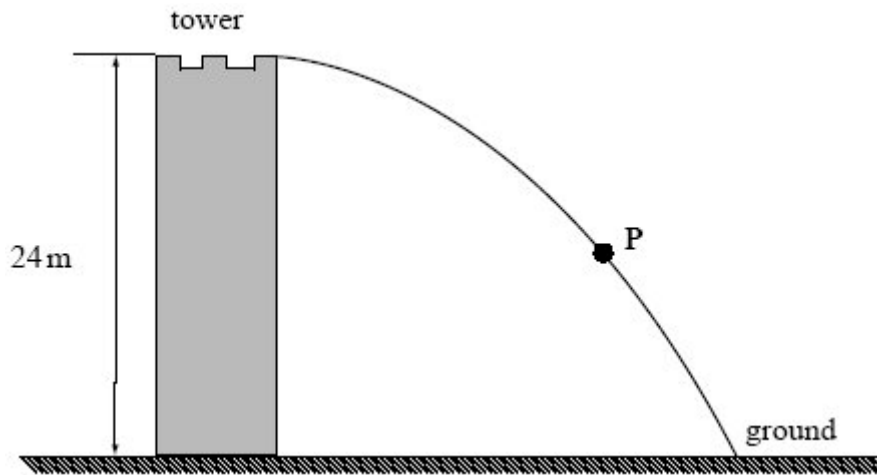


Figure 2

(4)
(Total 8 marks)

4. The diagram below shows the path of a ball thrown horizontally from the top of a tower of height 24 m which is surrounded by level ground.



- (a) Using two labelled arrows, show on the diagram above the direction of the velocity, v , and the acceleration, a , of the ball when it is at point **P**.

(2)

- (b) (i) Calculate the time taken from when the ball is thrown to when it first hits the ground. Assume air resistance is negligible.

Answer s

(2)

- (ii) The ball hits the ground 27 m from the base of the tower. Calculate the speed at which the ball is thrown.

Answer m s^{-1}

(2)

(Total 6 marks)