

Oakridge international school

Worksheet on unit-1 – Through Space and time

Answer the following question

Question 1a

Model trains move along a track passing through two model stations. Students analyse the motion of a train. They start a digital timer as the train starts to move. They record the time that it enters Station A and the time it enters Station B.

Fig 1.1 below shows the time on entering Station A and the time on entering Station B.



Fig. 1.1

Calculate the time taken from the train entering Station A to the train entering Station B.

State your answer in seconds.

time taken = s

[1 mark]

Question 1b

A faster train takes 54 s to travel from Station A to Station B. The distance between the stations is 120 m.

Calculate the average speed of this train.

average speed = m/s

[3 marks]

Question 1c

Fig. 1.2 shows the speed-time graph for a train travelling on a different part of the track.

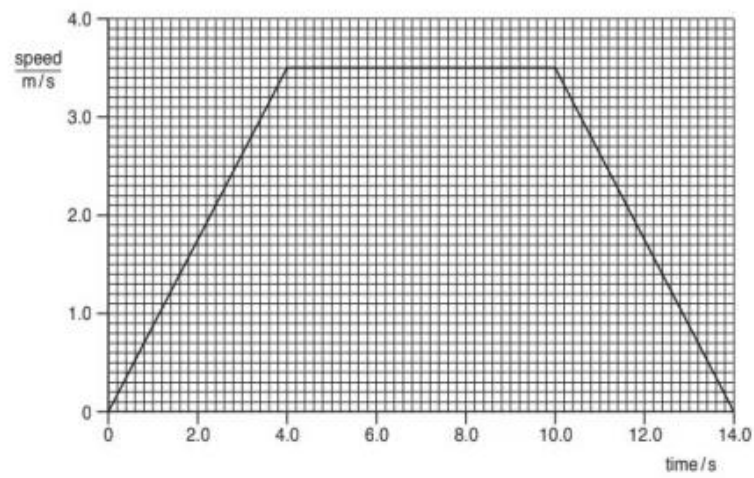


Fig. 1.2

Determine the total distance travelled by the train on this part of the track.

distance = m

[4 marks]

Question 3b

The length of the track is 250m.

Another cyclist goes around the track four times (four laps). This takes 80.0 seconds.

(i)

Calculate the average speed of this cyclist.

average speed = m/s [4]

(ii)

A friend of the cyclist starts a stopwatch at the beginning of the race.

Fig.2.2 shows the reading on the stopwatch when the cyclist has gone around the track **once**.

Fig.2.3 shows the reading on the stopwatch when the cyclist has gone around the track **twice**.



Fig. 2.2



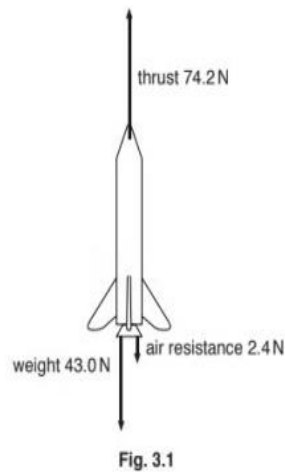
Fig. 2.3

Calculate the time taken for the cyclist to go around the track during the second lap.

time = s [1]

[5 marks]

Fig. 3.1 shows the vertical forces on a rocket.

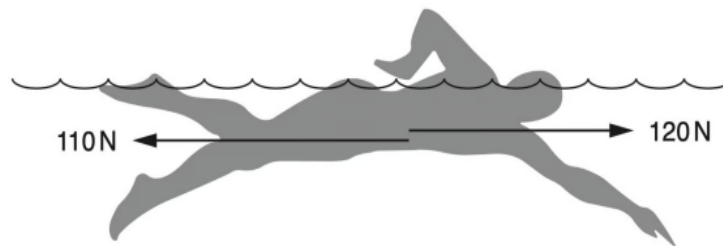


Calculate the resultant force on the rocket.

resultant force = N

direction =

Fig. 3.1 shows the horizontal forces acting on a swimmer.



(i)

Calculate the size and direction of the resultant horizontal force on the swimmer.

size of resultant horizontal force = N

direction of resultant horizontal force =

[1]

(ii)

State the name of the 110 N force on the swimmer.

[1]

