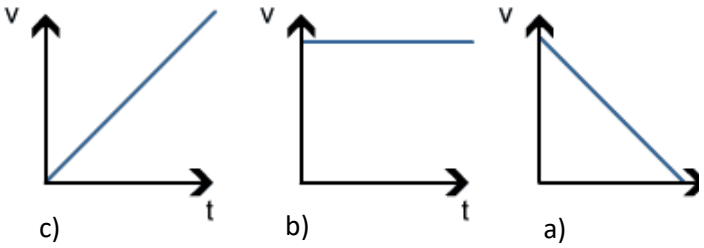
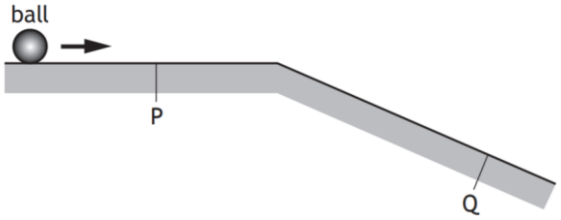
Firrhill High School	N4 N5	Dynamics		**3.** Velocity-Time Graphs

Section A

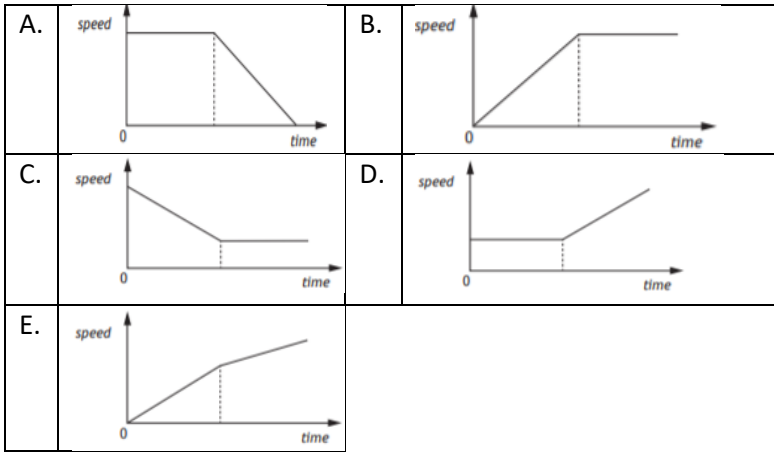
1. Label each speed-time graph to describe the motion of the object.



2. A ball moves along a horizontal frictionless surface and down a slope as shown.



Which of the following graphs shows how the speed of the ball varies with time as it travels from P to Q?



Section B

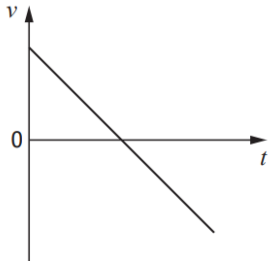
1. Explain the difference between speed and velocity.

2. Explain how the distance travelled by an object can be calculate from the velocity-time graph.

3. What does it indicate if the velocity of an object is negative?

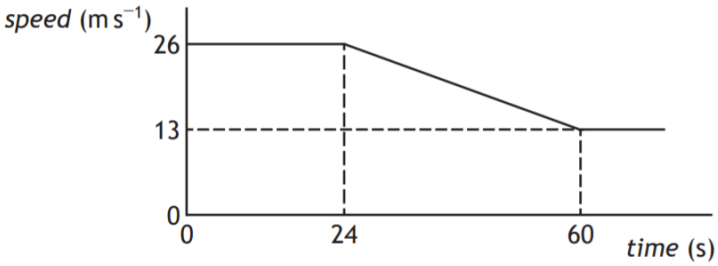
Section C

1. The graph shows how the velocity v of an object varies with time t.



The graph could represent the motion of

A. a ball falling freely downwards
B. a rocket accelerating upwards
C. a ball thrown into the air then falling back to Earth
D. a ball falling to Earth from rest then rebounding upwards again
E. a car slowing to a halt then accelerating in the same direction



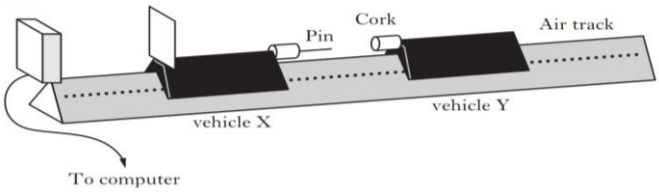
3. As a car approaches a village the driver applies the brakes. The speed time graph of the car's motion is shown.

The brakes are applied for

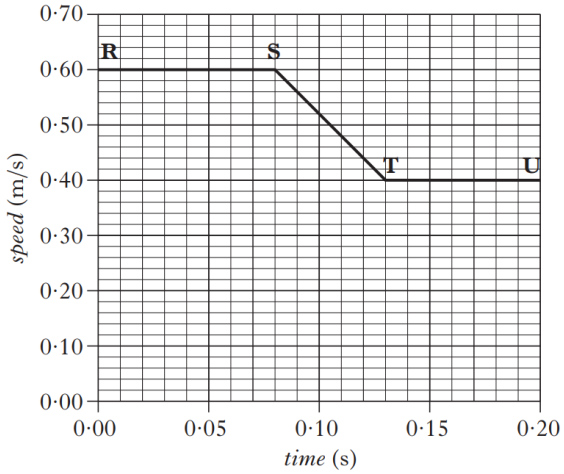
A. 13 s
B. 20 s
C. 24 s
D. 36 s
E. 60 s

Firrhill High School	N4 N5	Dynamics		**3.** Velocity-Time Graphs

1. A student uses a linear air track and a motion sensor to investigate a collision between two vehicles.



The motion sensor measures the speed of vehicle X every 0·01 s.
The graph shows the results obtained from the investigation after vehicle X has been released.



a) The motion sensor uses ultrasound waves. State the speed of ultrasound in air. **1**

b) Describe the motion of vehicle X between points S and T. **1**

c) Calculate the distance travelled by vehicle X between points S and T. **3**

2. A rollercoaster cart starts at rest and increases in speed steadily by $2ms^{-1}$ for 5s. The cart then continues at a constant speed for 2s before decreasing to rest in 3s. The cart then moves backwards, increasing in speed by $1ms^{-1}$ for 4s. **3**

Draw a velocity-time graph of this journey.
You should use the graph paper you took home.