5 How can the acceleration of an object be determined?

A from the area under a displacement–time graph

B from the area under a velocity–time graph

C from the gradient of a displacement–time graph

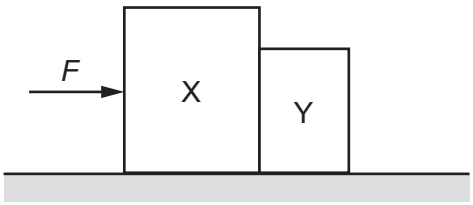
D from the gradient of a velocity–time graph

6 A sprinter takes a time of 11.0 s to run a 100 m race. She first accelerates uniformly from rest, reaching a speed of 10 m s^{-1}. She then runs at a constant speed of 10 m s^{-1} until the finish line.

What is the uniform acceleration of the sprinter for the first part of the race?

A 0.5 m s^{-2} **B** 0.91 m s^{-2} **C** 1.7 m s^{-2} **D** 5.0 m s^{-2}

7 A single horizontal force *F* is applied to a block X which is in contact with a separate block Y, as shown.



The blocks remain in contact as they accelerate along a horizontal frictionless surface. Air resistance is negligible. X has a greater mass than Y.

Which statement is correct?

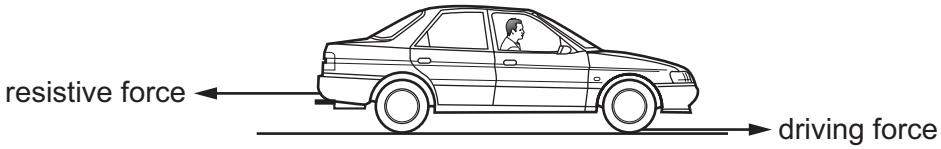
A The acceleration of X is equal to force *F* divided by the mass of X.

B The force that X exerts on Y is equal to *F*.

C The force that X exerts on Y is less than *F*.

D The force that X exerts on Y is less than the force that Y exerts on X.

8 A car of mass 750 kg has a horizontal driving force of 2.0 kN acting on it. It has a forward horizontal acceleration of 2.0 m s^{-2}.



What is the resistive force acting horizontally?

A 0.50 kN **B** 1.5 kN **C** 2.0 kN **D** 3.5 kN