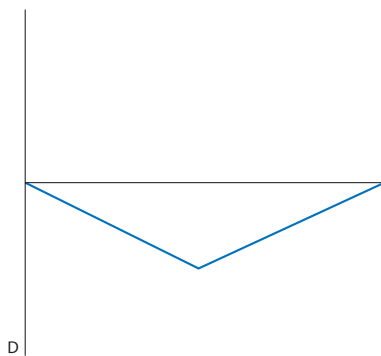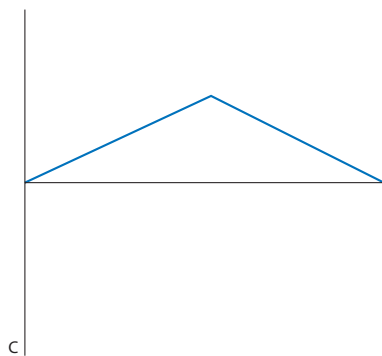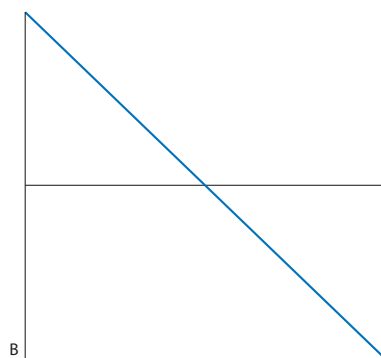# Self-test questions

Topic 2
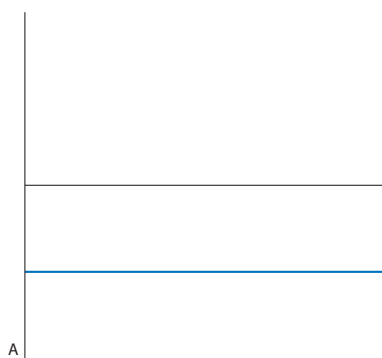
1 The graph shows the variation with time of the velocity of an object.
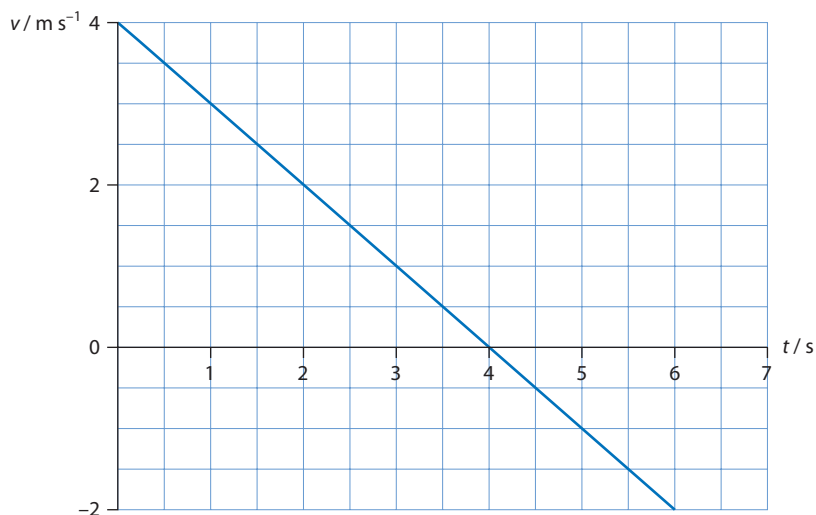
What is the distance travelled in 6.0 s?

A 6.0 m

B 8.0 m

C 10 m

D 12 m

2 A ball is thrown vertically upwards. The ball returns to the ground some time later. Which graph shows the variation with time of the acceleration of the ball? (Air resistance is ignored.)


A

B

C

D

3 Four balls are projected from the top of a building with equal speeds but in different directions. Which ball will get to the level ground with the least vertical component of velocity?
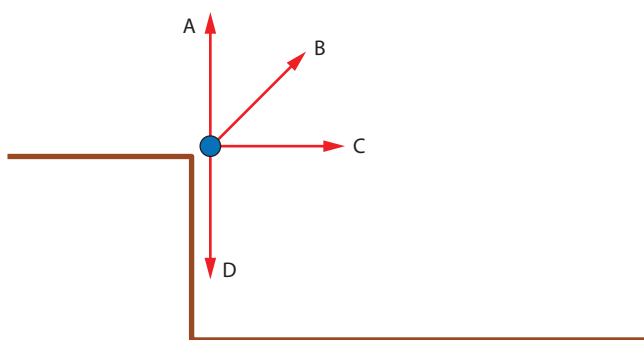

A
B
C
D

4 Three forces act on a particle. The particle is in equilibrium. Consider the statements:
I   The vector sum of the forces is zero
II The sum of the magnitudes of the forces is zero
III The forces have the same magnitude

Which of the following is always correct?
A I only
B III only
C I and II only
D I, II and III

5 A pulley of negligible mass is hung from the ceiling by a string. Two blocks of weight W are attached to another string that goes around the pulley as shown in the diagram. The blocks are at rest.
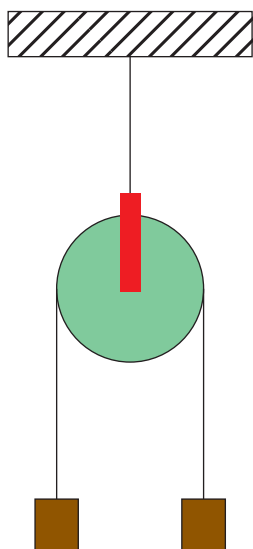
What is the tension in the string connecting the pulley to the ceiling?
A 0
B $\dfrac{W}{2}$
C W
D $2W$

6 A force of magnitude F is applied on a block of mass M as shown in the diagram. A frictional force f acts on the block as shown. The block does not move. What is the normal reaction force from the ground on the block?
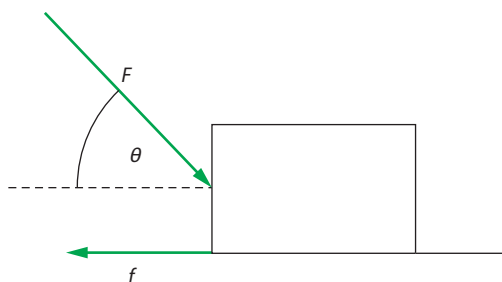
   A $F \sin\theta + Mg$
   B $F \cos\theta + Mg$
   C $f \sin\theta$
   D $f \cos\theta$

7 A block of mass 4.0 kg is placed on top of a block of mass 6.0 kg. The static coefficient of friction between the two blocks is 0.60 and the kinetic coefficient is 0.50. What is the largest force that can be applied to the 6.0 kg block so that the 4.0 kg block does not slip?
   A 50 N
   B 60 N
   C 70 N
   D 80 N

8 Two objects of mass m and $2m$ are travelling in opposite directions with the same speed v. The objects collide and stick together. What is the kinetic energy lost in the collision?
   A zero
   B $\dfrac{3mv^2}{2}$
   C $\dfrac{5mv^2}{6}$
   D $\dfrac{4mv^2}{3}$

9 A body of mass 2.0 kg and speed 8.0 m s⁻¹ is brought to rest in 4.0 s. What is the average force responsible for stopping the body?
   A 1.0 N
   B 4.0 N
   C 8.0 N
   D 16 N

10 A net force of 8.0 N accelerates a 4.0 kg body from rest to a speed of 5.0 m s⁻¹. What is the work done by the force?
   A 20 J
   B 32 J
   C 40 J
   D 50 J