

- 6 The time taken for an object to fall from rest through a certain distance on Mars is  $T_M$ . The time taken for the same object to fall from rest through the same distance on Earth is  $T_E$ . The acceleration of free fall on Mars is  $3.71 \text{ m s}^{-2}$ .

Assume that air resistance is negligible on both Earth and Mars.

What is the ratio  $\frac{T_M}{T_E}$ ?

- A 0.378      B 0.615      C 1.63      D 2.64

- 7 Which statement about mass is correct?

- A Mass has a magnitude and a direction.  
 B Mass resists changes in motion.  
 C The greater the mass of an object, the greater its acceleration when falling in a vacuum.  
 D The mass of an object depends on its location.

- 8 A snooker ball has a mass of 200 g. It hits the cushion of a snooker table and rebounds along its original path.

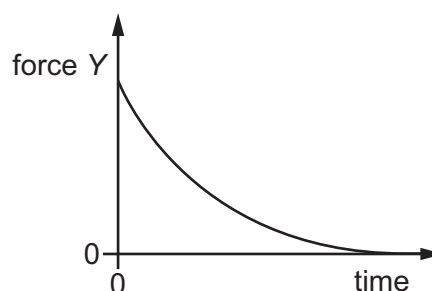
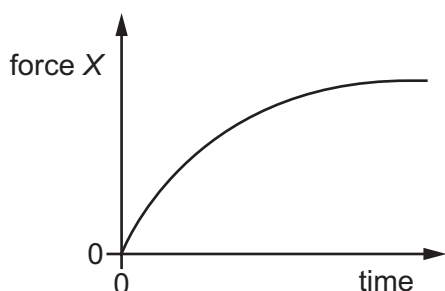
The ball arrives at the cushion with a speed of  $14.0 \text{ m s}^{-1}$  and then leaves it with a speed of  $7.0 \text{ m s}^{-1}$ . The ball and the cushion are in contact for a time of 0.60 s.

What is the average force exerted on the ball by the cushion?

- A 1.4 N      B 2.3 N      C 4.2 N      D 7.0 N

- 9 A ball falls from rest through air and eventually reaches a constant velocity.

For this fall, forces  $X$  and  $Y$  vary with time as shown.



What could be forces  $X$  and  $Y$ ?

	force $X$	force $Y$
A	air resistance	resultant force
B	air resistance	weight
C	upthrust	resultant force
D	upthrust	weight