

- 7 The momentum of a car changes from  $10\,000\text{ kg m/s}$  to  $15\,000\text{ kg m/s}$  in a time of  $8.0\text{ s}$ .

What is the resultant force acting on the car?

- A**  $630\text{ N}$       **B**  $3100\text{ N}$       **C**  $40\,000\text{ N}$       **D**  $200\,000\text{ N}$

- 6 A ball of mass  $m$  falls vertically and hits a hard surface.

Its speed on hitting the surface is  $v_1$ .

It rebounds vertically upwards with speed  $v_2$ .

What is the change in momentum of the ball?

- A**  $mv_1$       **B**  $mv_2$       **C**  $m(v_1 + v_2)$       **D**  $m(v_2 - v_1)$

- 7 A sphere X collides head on with a second identical sphere Y which is stationary.

The mass of each sphere is  $0.15\text{ kg}$ .

Sphere X is travelling at a velocity of  $2.0\text{ m/s}$  before the collision and produces an impulse of  $0.21\text{ N s}$  on sphere Y.

What is the velocity of sphere X after collision?

- A**  $0.60\text{ m/s}$  in the opposite direction to Y  
**B**  $0.60\text{ m/s}$  in the same direction as Y  
**C**  $1.4\text{ m/s}$  in the opposite direction to Y  
**D**  $1.4\text{ m/s}$  in the same direction as Y