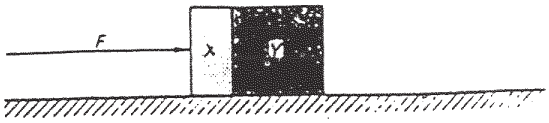
Q4 ✓ D1

Two blocks, X and Y, of masses m and $2m$ respectively, are accelerated along a smooth horizontal surface by a force F applied to block X, as shown in the diagram.



What is the magnitude of the force exerted by block Y on block X during this acceleration?

A 0

B $\frac{F}{3}$

C $\frac{F}{2}$

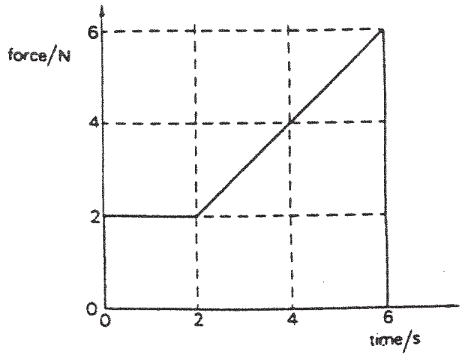
D $\frac{2F}{3}$

E F

J90/Q2

Q8 D2

The graph shows how the force acting on a body varies with time.



Assuming that the body is moving in a straight line, by how much does its momentum change?

A 40kg ms^{-1}
B 36kg ms^{-1}
C 20kg ms^{-1}
D 16kg ms^{-1}
E 10kg ms^{-1}

D90/Q5

Q10 D3

Three identical stationary discs, P, Q and R are placed in a line on a horizontal, flat, frictionless surface. Disc P is projected straight towards disc Q.

If all consequent collisions are perfectly elastic, what will be the final motion of the three discs?

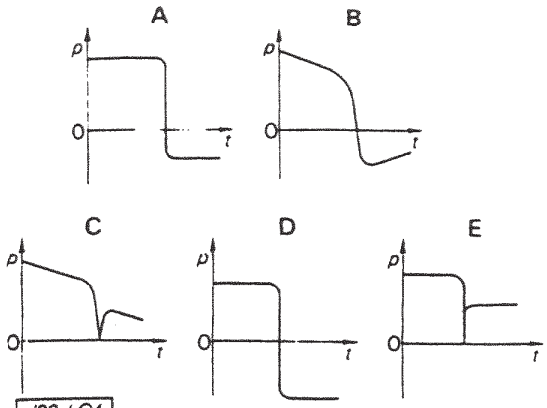
	P	Q	R
A	moving left	moving left	moving right
B	moving left	stationary	moving right
C	moving left	moving right	moving right
D	stationary	stationary	moving right
E	moving right	moving right	moving right

J91/Q4

Q11 D4

An ice-hockey puck slides along a horizontal, frictionless ice-rink surface. It collides inelastically with a wall at right angles to its path, and then rebounds along its original path.

Which graph shows the variation of the momentum p of the puck with time t?



J92/Q4

Q13 D5

A neutron is in head-on elastic collision with a stationary nitrogen nucleus. The mass of a nitrogen nucleus is 14 times that of a neutron.

The neutron's velocity after the collision is

A less in magnitude than its initial velocity.
B less in magnitude than the final velocity of the nitrogen atom.
C equal in magnitude to its initial velocity but in the opposite direction.
D greater in magnitude than its initial velocity.
E zero.

J93/Q4

Q26 D6

A mass accelerates uniformly when the resultant force acting on it

A is zero.
B is constant but not zero.
C increases uniformly with respect to time.
D is proportional to the displacement of the mass from a fixed point.

J97/Q4

Q29 D7

The diagram shows two trolleys, X and Y, about to collide and gives the momentum of each trolley before the collision.

After the collision, the directions of motion of both trolleys are reversed and the magnitude of the momentum of X is then 2 N s.

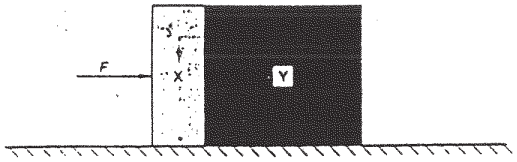
What is the magnitude of the corresponding momentum of Y?

A 6 Ns B 8 Ns C 10 Ns D 30 Ns

D98 / Q4

Q33 D8

Two blocks X and Y, of masses m and $3m$ respectively, are accelerated along a smooth horizontal surface by a force F applied to block X as shown.



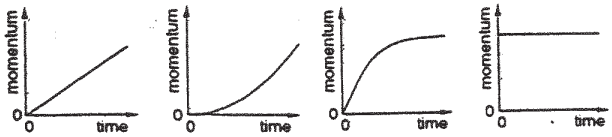
What is the magnitude of the force exerted by block X on block Y during this acceleration?

A $\frac{F}{4}$ B $\frac{F}{3}$ C $\frac{F}{2}$ D $\frac{3F}{4}$

Q38 D9

Which graph best shows the variation with time of the momentum of a body accelerated by a constant force?

A B C D



J01 / Q4