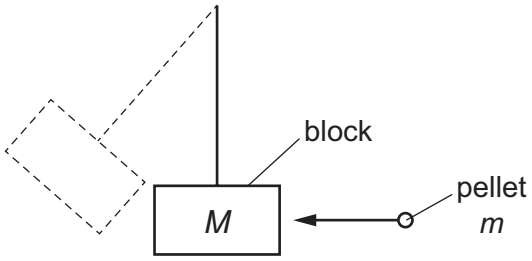
11 The diagram shows a 'ballistic pendulum'.



A pellet of mass *m* travelling at a speed *u* hits a stationary block of mass *M.* The pellet becomes embedded in the block and causes the block to move at a speed *v* immediately after the impact.

When a pellet of mass 2*m*, travelling at a speed 2*u*, hits a block of mass 2*M*, what is the speed of the block immediately after the impact? (Neglect the small increase in the mass of the block as the pellet's mass is added during the collision.)

A v **B** $v\sqrt{2}$ **C** $2v$ **D** $4v$

12 A rigid circular disc of radius *r* has its centre at X. A number of forces of equal magnitude *F* act at the edge of the disc. All the forces are in the plane of the disc.

Which arrangement of forces provides a total moment of magnitude 2*Fr* about X?