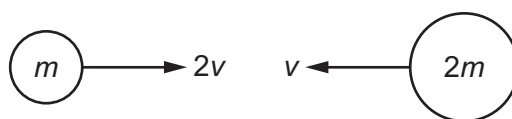10 Two balls, of masses m and $2m$, travelling in a vacuum with initial velocities $2v$ and v respectively, collide with each other head-on, as shown.

After the collision, the ball of mass m rebounds to the left with velocity v.

What is the loss of kinetic energy in the collision?

A $\frac{3}{4} mv^2$ **B** $\frac{3}{2} mv^2$ **C** $\frac{9}{4} mv^2$ **D** $\frac{9}{2} mv^2$

11 A force F is applied at an angle of 45° to a door handle at a distance d from the pivot of the handle, as shown.
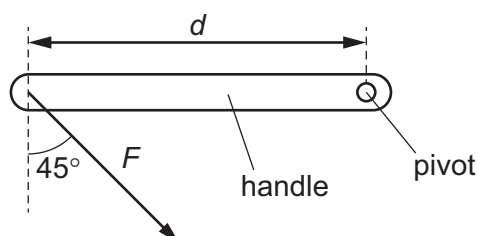
What is the moment of the force about the pivot?

A $\dfrac{Fd}{\sqrt{2}}$ **B** Fd **C** $Fd\sqrt{2}$ **D** $2Fd$

12 A couple consists of two forces, each of magnitude F, that act in opposite directions in the same plane.

The perpendicular distance between the two forces is d.
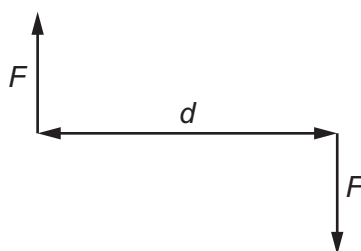
What is the torque of the couple?

A $\dfrac{Fd}{2}$ **B** $\dfrac{F}{d}$ **C** Fd **D** $2Fd$