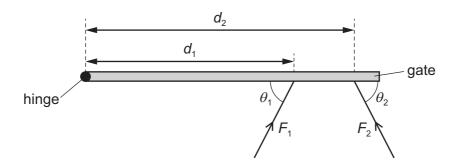
12 Two people push a vertical gate to open it. The forces exerted by the people on the gate are shown

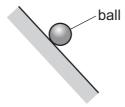


One person is distance  $d_1$  from the gate's hinge and pushes with horizontal force  $F_1$  at angle  $\theta_1$  to the gate.

The other person is at distance  $d_2$  from the hinge and pushes with horizontal force  $F_2$  at an angle  $\theta_2$  to the gate.

What is the total moment about the hinge due to forces  $F_1$  and  $F_2$ ?

- **A**  $(d_1 \times F_1 \cos \theta_1) + (d_2 \times F_2 \cos \theta_2)$
- **B**  $(d_1 \times F_1 \sin \theta_1) + (d_2 \times F_2 \sin \theta_2)$
- **C**  $(d_1 \times F_1 \cos \theta_1) (d_2 \times F_2 \cos \theta_2)$
- $\mathbf{D} \quad (\mathbf{d}_1 \times \mathbf{F}_1 \sin \theta_1) (\mathbf{d}_2 \times \mathbf{F}_2 \sin \theta_2)$
- **13** A ball is rolling down a slope at a constant speed. The three forces acting on the ball are its weight, the contact force normal to the slope and friction.



Which diagram could represent these three forces?

