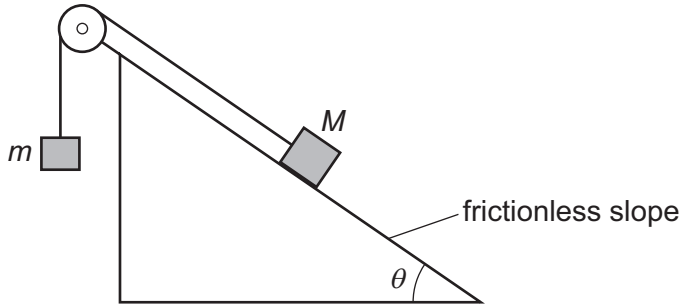
8 Two masses, *M* and *m*, are connected by an inextensible string which passes over a frictionless pulley. Mass *M* rests on a frictionless slope, as shown.



The slope is at an angle θ to the horizontal.

The two masses are initially held stationary and then released. Mass *M* accelerates down the slope.

Which expression **must** be correct?

A $\sin\theta < \frac{m}{M}$ **B** $\cos\theta < \frac{m}{M}$ **C** $\sin\theta > \frac{m}{M}$ **D** $\cos\theta > \frac{m}{M}$

9 The weights and masses of four different objects on the surfaces of four different planets are shown.

Which planet has the lowest value of acceleration of free fall at its surface?

	weight	mass
A	40 mN	6.0 g
B	3.0 N	500 g
C	10 N	1 kg
D	2.6 kN	750 kg

10 A rock in deep space is travelling towards a distant star and collides with a stationary spacecraft.

What is **not** a possible outcome of the collision?

A The rock becomes stationary and the spacecraft moves towards the star.

B The rock moves away from the star and so does the spacecraft.

C The rock moves away from the star and the spacecraft moves towards the star.

D The rock moves towards the star and so does the spacecraft.