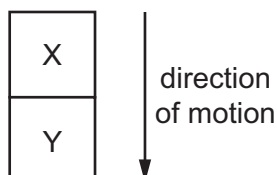


13 In which example is it **not** possible for the underlined body to be in equilibrium?

- A an aeroplane climbs at a steady rate
- B an aeroplane tows a glider at a constant altitude
- C a speedboat changes direction at a constant speed
- D two tug boats tow a ship into harbour

14 Two blocks X and Y are falling through a vacuum in a uniform gravitational field, as shown.



Block X has weight  $2w$ .

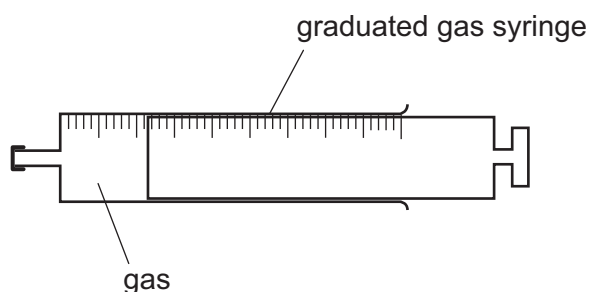
Block Y has weight  $w$ .

The blocks do not move apart.

Which value best represents the force exerted by block X on block Y?

- A 0                      B  $w$                       C  $1.5w$                       D  $2w$

15 A gas is contained inside a sealed syringe, as shown.



The volume of gas at room temperature is  $2.0 \text{ cm}^3$ .

Atmospheric pressure is  $101 \text{ kPa}$ .

What is the work done by the gas when it is heated and expands to a volume of  $6.0 \text{ cm}^3$ ?

- A  $404 \mu\text{J}$                       B  $404 \text{ mJ}$                       C  $404 \text{ J}$                       D  $404 \text{ kJ}$