

**12** A student states that:

'If an object is in equilibrium, the sum of the clockwise moments about a point X is equal to the sum of the anticlockwise moments about a point Y.'

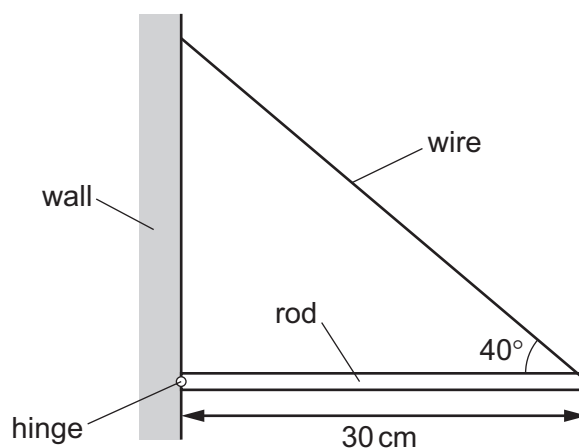
Which condition would make the student's statement correct?

- A** Either X or Y is the centre of gravity of the object.
- B** Either X or Y is the pivot of the object.
- C** X and Y are at opposite ends of the object.
- D** X and Y are the same point on the object.

**13** A uniform rod of length 30 cm and weight 5.2 N is attached to a wall by a hinge at one end.

The other end of the rod is supported by a wire so that the rod is horizontal and in equilibrium.

The wire is at an angle of  $40^\circ$  to the horizontal.



What is the tension in the wire?

- A** 3.4 N
- B** 4.0 N
- C** 6.8 N
- D** 8.1 N

**14** Water is pumped through a nozzle at the end of a hose. The nozzle has a circular cross-section of diameter 50 mm. A mass of 100 kg of water takes a time of 2.0 s to move through the nozzle. The density of water is  $1000 \text{ kg m}^{-3}$ .

What is the speed of the water in the nozzle?

- A**  $6.4 \text{ ms}^{-1}$
- B**  $13 \text{ ms}^{-1}$
- C**  $25 \text{ ms}^{-1}$
- D**  $51 \text{ ms}^{-1}$