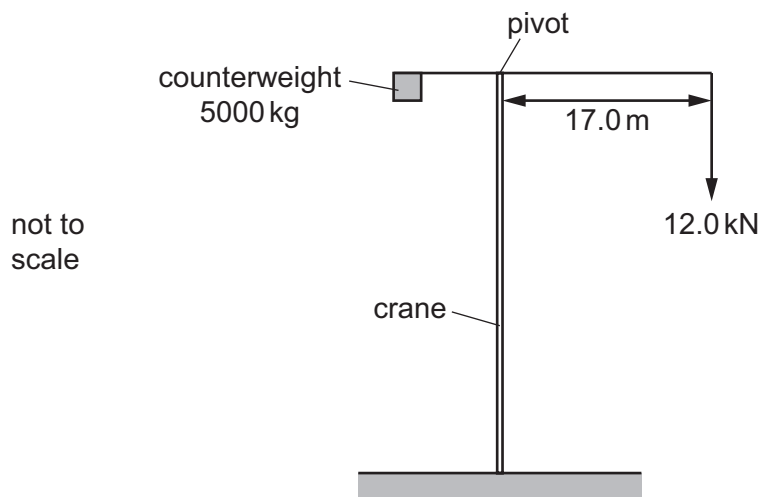


- 14 A crane uses a counterweight to stop it from toppling over when lifting a load, as shown.



The counterweight has a mass of 5000 kg. The crane is required to lift a load of 12.0 kN and the horizontal distance from the pivot to the load is 17.0 m.

How far from the pivot should the centre of gravity of the counterweight be positioned in order to keep the crane in equilibrium?

- A** 0.0408 m      **B** 0.240 m      **C** 4.16 m      **D** 40.8 m
- 15 Three parallel forces act on an object. As a result of these forces, the object is in equilibrium.
- What **must** be correct for these forces?
- A** They all act along the same line.  
**B** They all have the same magnitude.  
**C** They do **not** all act along the same line.  
**D** They do **not** all have the same magnitude.
- 16 An empty glass beaker has a mass of 103 g. When filled with water, it has a total mass of 361 g. When filled with cooking oil, it has a total mass of 351 g.

The density of water is  $1.00 \text{ g cm}^{-3}$ .

What is the density of the cooking oil?

- A**  $0.961 \text{ g cm}^{-3}$       **B**  $0.972 \text{ g cm}^{-3}$       **C**  $1.03 \text{ g cm}^{-3}$       **D**  $1.04 \text{ g cm}^{-3}$