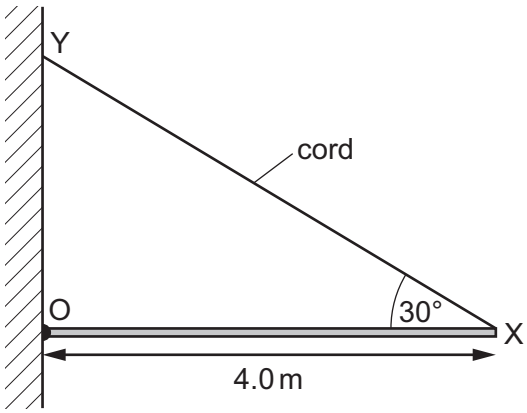
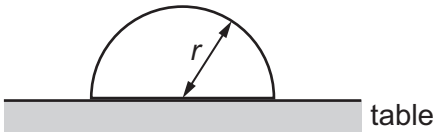
13 A uniform horizontal beam OX, 4.0 m long and weighing 100 N, is hinged at a wall at point O. It is supported by a cord XY which is attached to the wall at Y.



What is the tension in the cord?

A 50 N **B** 58 N **C** 86 N **D** 100 N

14 An object shaped as a hemisphere rests with its flat surface on a table. The object has radius r and density ρ.



The volume of a sphere is $\frac{4}{3}\pi r^3$.

Which average pressure does the object exert on the table?

A $\frac{1}{3}\rho r^2$ **B** $\frac{1}{3}\rho r^2 g$ **C** $\frac{2}{3}\rho r$ **D** $\frac{2}{3}\rho rg$

15 Which statement best represents the principle of conservation of energy?

A Energy cannot be used faster than it is created.

B The supply of energy is limited, so energy must be conserved.

C The total energy in a closed system is constant.

D The total energy input to a system is equal to the useful energy output.

16 A crane is being used to lift containers off a ship. One container has a mass of 14 000 kg and is being lifted vertically with a speed of 3.2 m s^{-1}.

The electric motor being used to supply the power to lift the container is using a current of 240 A at a potential difference of 2200 V.

What is the efficiency of the system?

A 8.1% **B** 8.5% **C** 48% **D** 83%