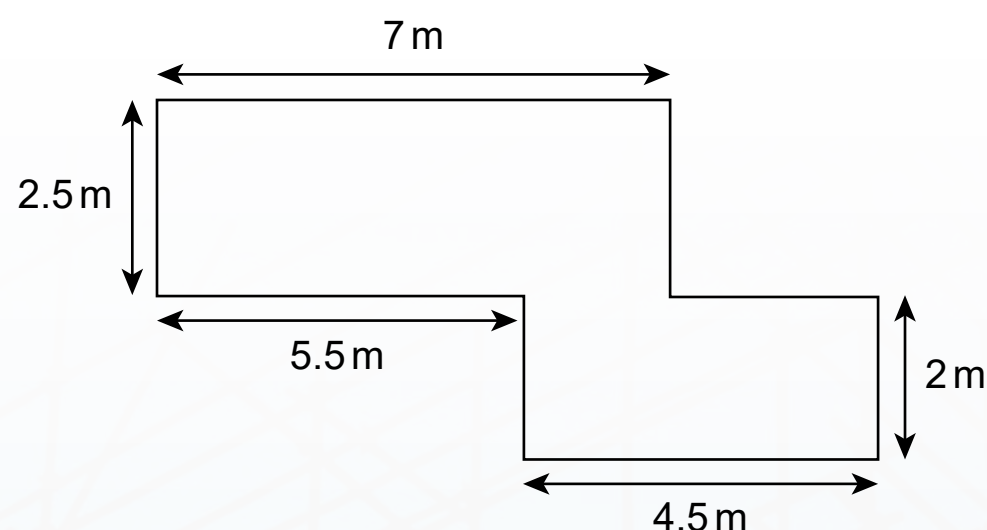


1. A water tank has a base as shown in the diagram.



- Calculate the area of the base of the tank.
- Assuming that walls of the tank are 4 m high, calculate the wall area of the tank.
- Calculate how much water the tank would hold, assuming that $1 \text{ m}^3 = 1000 \text{ litres}$.
- Calculate the surface area of the water tank.

2. The rear wall of a house extension is to be built using standard bricks. The bricks have a length of 215 mm and a height of 65 mm. The bricks are to be laid lengthwise with a 10 mm mortar joint being used in the construction of the wall.

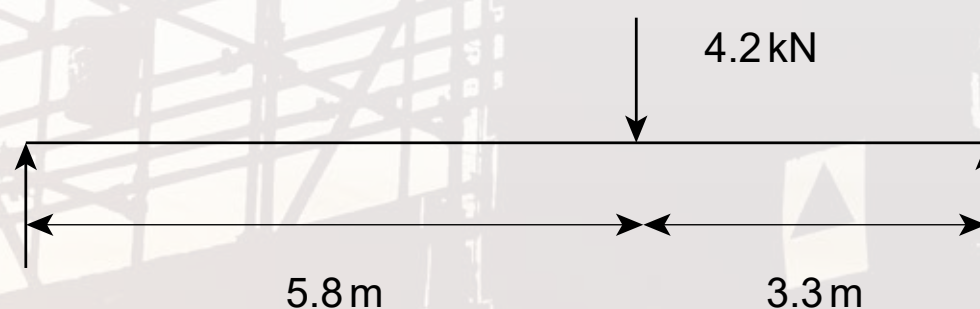
The wall is to be 9 m long and 3 m high. It is to include an opening for a door that is 0.9 m wide and 2.25 m tall and a set of patio doors that are 1.8 m tall and 2.1 m wide.

Calculate the total number of bricks required to construct the wall assuming that the door and patio doors are positioned to minimise waste.

3. A balcony is supported by horizontal cantilever beams. Each beam carries a uniformly distributed load of 3.7 kN/m and is 4.1 m long.

Calculate the maximum bending moment in each beam.

4. A simply supported beam carries a point load, off centre.



Calculate the maximum bending moment in the simply supported beam.

5. A contractor stores fuel for the plant being used on site in a cylindrical storage container. The container has a diameter of 3.8 m and a height of 4.5 m.

- Calculate the volume of the cylinder.

The contractor wishes to paint the outside of the cylinder. Assuming 1 litre of paint covers 1 m^2 of the cylinder:

- Calculate the number of litres required to paint the cylinder.
- The paint to be used is provided in 12.5 litre tins. Calculate how many tins will be required.