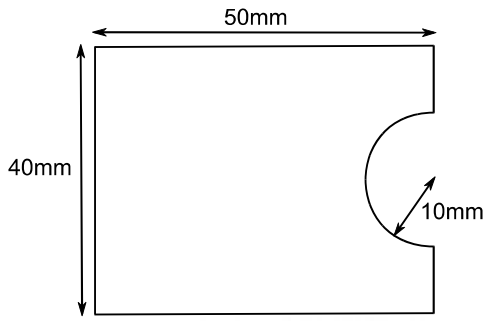
Density – Tutorial

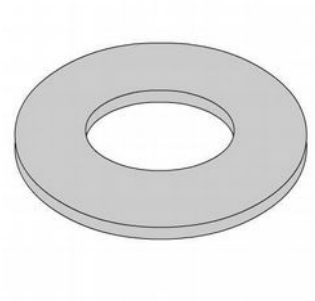
1. This shape is punched out of aluminium alloy sheet, thickness 3.0 mm.
   Calculate its mass in grams.
   density of aluminium alloy = 2800 kg/m^3

   (15.5 g)



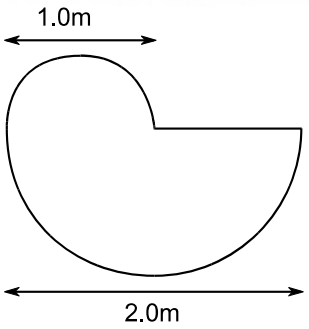
2. An M20 steel washer has the following dimensions:
   internal diameter = 21.0 mm
   external diameter = 36.5 mm
   thickness = 3.0 mm

   Calculate the mass of a washer, in grams. *(16.5 g)*
   density of steel = 7860 kg/m^3



3. This shape, cast in concrete with a uniform thickness of 150mm, is part of an art installation.
   Calculate its mass.
   density of concrete = 2400 kg/m^3

   (706 kg)



4. A concrete tube has external diameter 600mm and a mass of 340 kg per metre. Calculate the wall thickness.
   density of concrete = 2400 kg/m^3

   (88 mm)

5. A light alloy consists of 70% aluminium and 30% magnesium by mass.
   Calculate the density of the alloy. *(2320 kg/m^3)*
   density of aluminium = 2700 kg/m^3
   density of magnesium = 1740 kg/m^3
   (hint: suppose that there is 1kg of alloy; calculate volumes of aluminium and magnesium in this 1kg; add these to get total volume of 1kg)

6. A 3.0m length of scaffold tube, with external diameter 48.3mm, has a mass of 13.1 kg.
   Calculate the internal diameter. *(40.3 mm)*
   density of steel = 7860 kg/m^3