The science department are making model planets. The radius of the model Earth is 7 cm. They are using a metal with density of 0.6 g/cm³. Calculate the mass of the sphere.

\[ \text{mass} = \frac{4}{3} \pi r^3 \times \frac{9}{10} \]

\[ m = \frac{4}{3} \pi (7)^3 	imes 0.6 \]

\[ m = 86.208 \text{ g} \]

Sean is going to cover the patio with paving slabs. Each paving slab is a square of side 40 cm. Sean buys 380 slabs, does he have enough?

\[ 16 \times 25 = 375 \text{ slabs in total} \]

Yes, he has some slabs spare.

The diagram shows a packet of three jams in a Christmas packet. Each jar is the same size. Calculate the total amount of jam in the present.

Volume of a cylinder:

\[ V = \pi r^2 h \]

\[ V = \pi (3)^2 \times 8 = 46.18 \text{ cm}^3 \]

Volume of a small cylinder:

\[ V = \pi r^2 h \]

\[ V = \pi (1.5)^2 \times 8 = 18.13 \text{ cm}^3 \]

Calculate the volume of the toilet roll.

\[ V = 200 \pi - 18 \pi = 182 \pi \]

\[ V = 571.77 \text{ cm}^3 \]

A DVD has measurements 2cm x 12cm x 10cm. How many DVD’s can fit in the box?

\[ V = 24 \text{ cm}^3 \]

\[ 24 \times 12 = 48 \text{ DVDs can fit inside the box.} \]

Pasta Strip

5cm

When making ravioli a chef needs to cut circles out of pasta as waste as little pasta as possible. The chef has a cutter that cuts the ravioli.

\[ A_{\text{circle}} = \pi r^2 \]

\[ A_{\text{circle}} = \pi (5)^2 = 78.54 \text{ cm}^2 \]

\[ A_{\text{square}} = 5 \times 5 = 25 \text{ cm}^2 \]

\[ \text{waste} = 5.4 \times 10 = 54 \text{ cm}^2 \]

It’s possible to draw many rectangles that have an area of 18 cm². Plot the possible dimensions of the rectangle on the graph.

What is the largest possible perimeter of the rectangle?

10m

8m

5cm

What is the area of the wasted pasta?