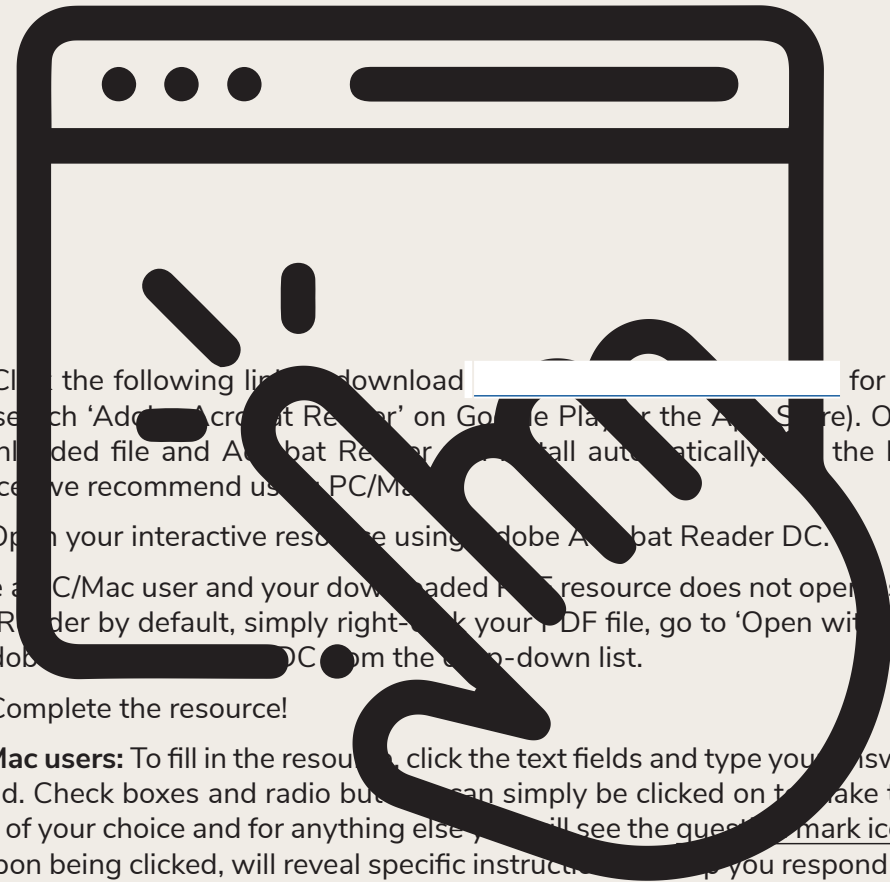


## Thanks for downloading this resource!

The zip folder that you've just opened contains a PDF file with **interactive features**.

In a move towards offering an even more versatile spread of resources, some of our worksheets feature interactive fields that can be filled in on computers and smart devices, without having to print the page. Follow the guidance in the next column for a smooth, stress-free means of accessing this content using free-to-download PDF reading software.



**Step 1:** Click the following link to download [Adobe Acrobat Reader DC](#) for PC/Mac (or search 'Adobe Acrobat Reader' on Google Play or the App Store). Open the downloaded file and Adobe Acrobat Reader will install automatically. For the best experience we recommend using PC/Mac.

**Step 2:** Open your interactive resource using Adobe Acrobat Reader DC.

If you are a PC/Mac user and your downloaded PDF resource does not open using Acrobat Reader by default, simply right-click your PDF file, go to 'Open with' and select Adobe Acrobat Reader DC from the drop-down list.

**Step 3:** Complete the resource!

**For PC/Mac users:** To fill in the resource, click the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice and for anything else you will see the question mark icon which, upon being clicked, will reveal specific instructions for you respond to the corresponding question or activity. When you are finished with the resource, go to File > Save As... and save your file in a memorable location.

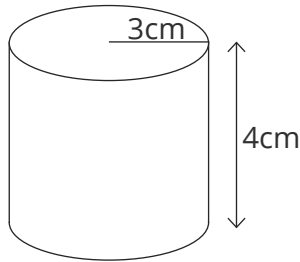
**For smart device users:** To fill in the resource, follow the same process as described above. When you are finished, simply press the back button in the top left of the appscreen and your PDF will save automatically.

**Remember:** Saving your PDF will overwrite the original file, so be sure to create a copy before starting if you wish to keep a blank copy of the resource on your device.

We hope you have found this information useful. If you experience any problems in following the instructions above, please contact the Beyond team at [beyond@regentstudies.com](#) and we will do our best to help with your query.

**Your Turn**

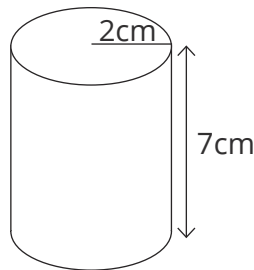
1. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



$$\pi \times 3^2 \times 4 = 113.0973355\dots$$

$$113\text{cm}^3$$

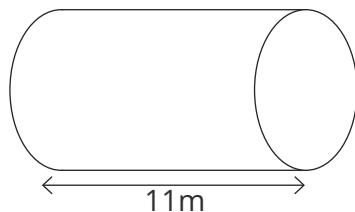
2. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



$$\pi \times 2^2 \times 7 = 87.9645943\dots$$

$$88\text{cm}^3$$

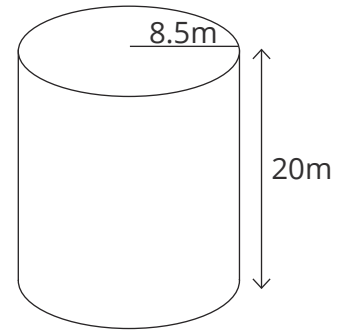
3. The cylinder has a radius of 2.5m. Calculate the volume of the cylinder, giving your answer correct to 2 decimal places.



$$\pi \times 2.5^2 \times 11 = 215.9844949\dots$$

$$215.98\text{m}^3$$

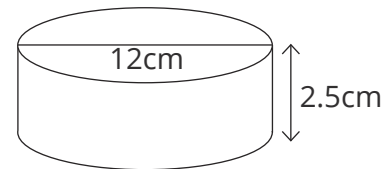
4. Calculate the volume of the cylinder, giving your answer correct to one decimal place.



$$\pi \times 8.5^2 \times 20 = 4539.601384\dots$$

$$4539.6\text{m}^3$$

5. Calculate the volume of the cylinder, giving your answer correct to 1 decimal place.

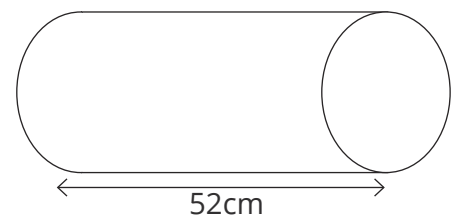


$$12 \div 2 = 6\text{cm}$$

$$\pi \times 6^2 \times 2.5 = 282.7433388\dots$$

$$282.7\text{cm}^3$$

6. A cylinder has a **diameter** of 22cm. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



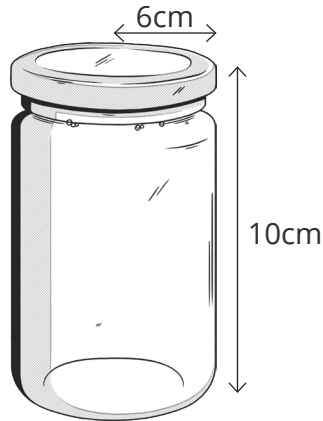
$$22 \div 2 = 11\text{cm}$$

$$\pi \times 11^2 \times 52 = 19\,766.90098\dots$$

$$19\,767\text{cm}^3$$

Volume of a Cylinder **Answers**

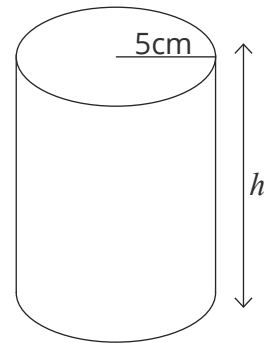
7. Honey comes in cylindrical jars with a radius of 6cm and a height of 10cm. How many cubic centimetres of honey (to the nearest cubic centimetre) will each jar hold?



$$\pi \times 6^2 \times 10 = 1130.973355...$$

**1130cm<sup>3</sup>**

8. The volume of the cylinder is 1000cm<sup>3</sup>. Calculate the height of the cylinder, giving your answer correct to the nearest centimetre.



$$\pi \times 5^2 = 78.53981634...$$

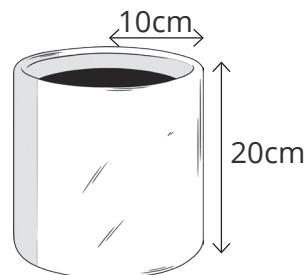
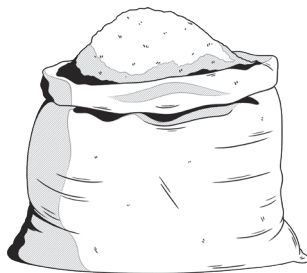
$$1000 \div 78.53981634... = 12.73239545...$$

**13cm**

**Challenge**

Rachel is filling cylindrical plant pots with soil. Each plant pot is completely filled. Bags of soil are sold in 100 litre bags. Rachel buys 1 bag. How many plant pots can she **completely** fill with the soil?

1 litre = 1000cm<sup>3</sup>



$$\pi \times 10^2 \times 20 = 6283.185307...$$

$$6283.185307... \text{cm}^3 = 6.283185307... \text{ litres}$$

$$100 \div 6.283185307... = 15.91549431...$$

**15 plant pots**

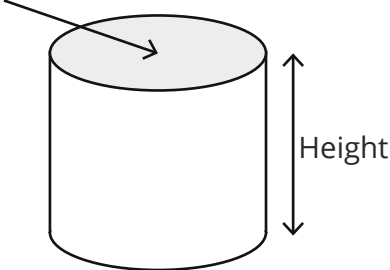
# Volume of a Cylinder

## Prior Knowledge:

Before attempting this sheet, students should be able to calculate the area of a circle and round numbers to whole numbers, 1 decimal place and 2 decimal places.

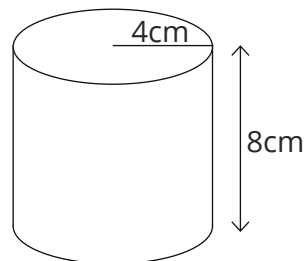
The volume of a shape is the measure of the **three-dimensional** space it covers. The units of measurement for volume are **cubic units**, for example  $\text{cm}^3$  or  $\text{m}^3$ .

To calculate the volume of a cylinder (or a prism), learn this formula by heart.

<b>Volume of a cylinder = area of cross-section × height</b>
Area of cross-section (In other words – the area of the circle)


## For example:

Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



The first step is to calculate **the area of the cross-section**. In other words, you need to calculate the area of the base of the shape. (The **base** is always the face which is the same as the cross-section). This shape is a cylinder; its **base** is a circle. Therefore, you need to calculate the area of the circle ( $\pi r^2$ ).

$$\pi \times 4^2$$

$$\pi \times 16 = 50.26548246\dots$$

It's important that you **don't round your answer at this stage** – you could also leave your answer in terms of  $\pi$ , for example  $16\pi$ .

Now, multiply the area of the circle by the height.

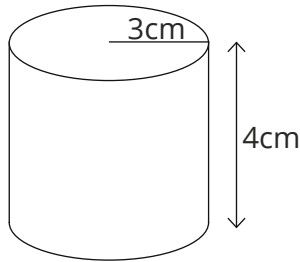
$$50.26548246\dots \times 8 = 402.1238597\dots$$

As you don't have any further calculations to do, you should now round the answer to the degree of accuracy that the question has asked for. In this case, you need to give your answer correct to the nearest **whole** number.

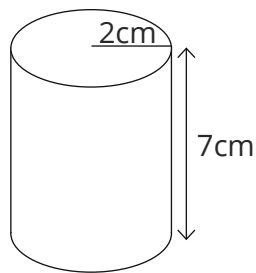
The answer is  $402\text{cm}^3$ . (Don't forget the units!)

Your Turn

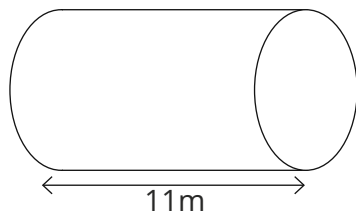
- Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



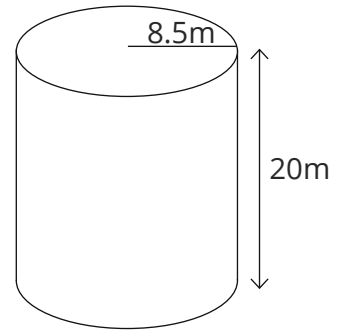
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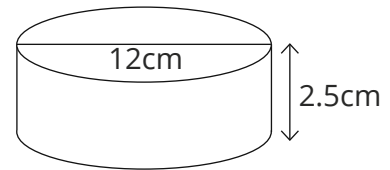
- The cylinder has a radius of 2.5m. Calculate the volume of the cylinder, giving your answer correct to 2 decimal places.



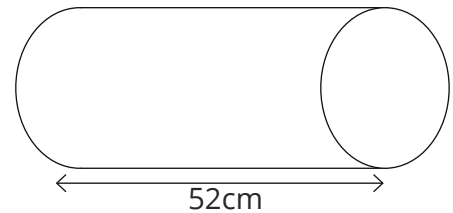
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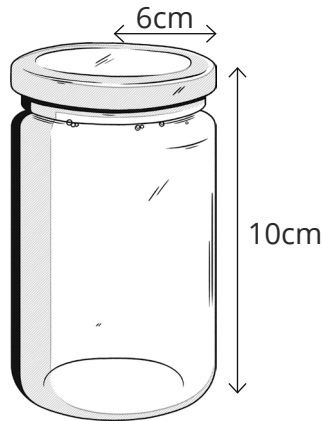


- A cylinder has a **diameter** of 22cm. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.

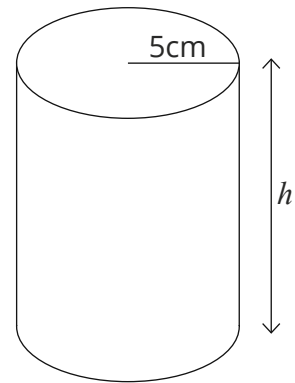


## Volume of a Cylinder

7. Honey comes in cylindrical jars with a radius of 6cm and a height of 10cm. How many cubic centimetres of honey (to the nearest cubic centimetre) will each jar hold?



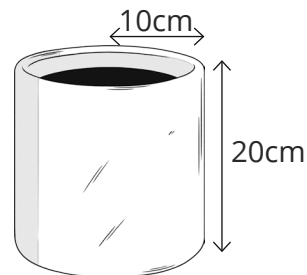
8. The volume of the cylinder is  $1000\text{cm}^3$ . Calculate the height of the cylinder, giving your answer correct to the nearest centimetre.



### Challenge

Rachel is filling cylindrical plant pots with soil. Each plant pot is completely filled. Bags of soil are sold in 100 litre bags. Rachel buys 1 bag. How many plant pots can she **completely** fill with the soil?

$$1 \text{ litre} = 1000\text{cm}^3$$



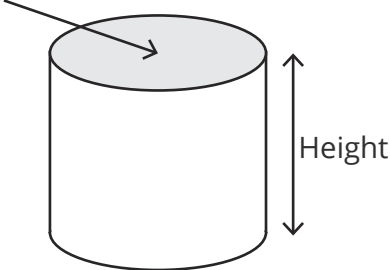
# Volume of a Cylinder

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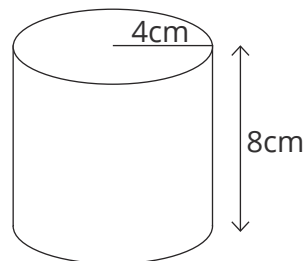
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## For example:

Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.



The first step is to calculate **the area of the cross-section**. In other words, you need to calculate the area of the base of the shape. (The **base** is always the face which is the same as the cross-section). This shape is a cylinder; its **base** is a circle. Therefore, you need to calculate the area of the circle ( $\pi r^2$ ).

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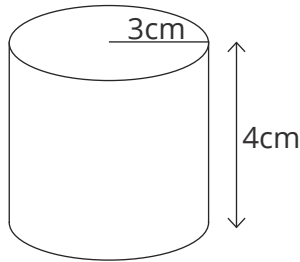
$$50.26548246\dots \times 8 = 402.1238597\dots$$

As you don't have any further calculations to do, you should now round the answer to the degree of accuracy that the question has asked for. In this case, you need to give your answer correct to the nearest **whole** number.

The answer is  $402\text{cm}^3$ . (Don't forget the units!)

**Your Turn**

1. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.




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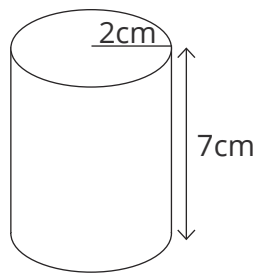


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2. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.




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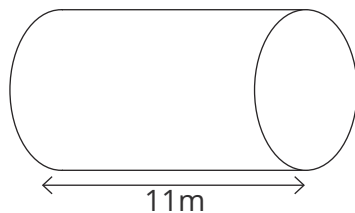


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3. The cylinder has a radius of 2.5m. Calculate the volume of the cylinder, giving your answer correct to 2 decimal places.




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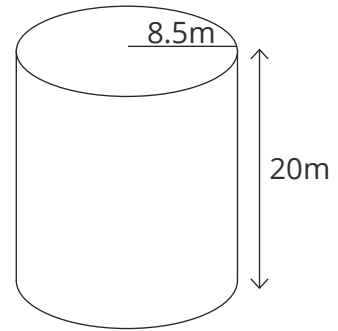


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4. Calculate the volume of the cylinder, giving your answer correct to one decimal place.




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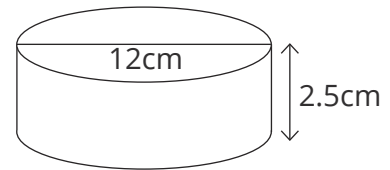


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5. Calculate the volume of the cylinder, giving your answer correct to 1 decimal place.




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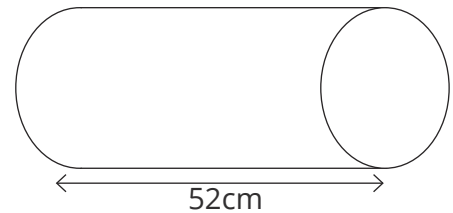


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6. A cylinder has a **diameter** of 22cm. Calculate the volume of the cylinder, giving your answer correct to the nearest whole number.




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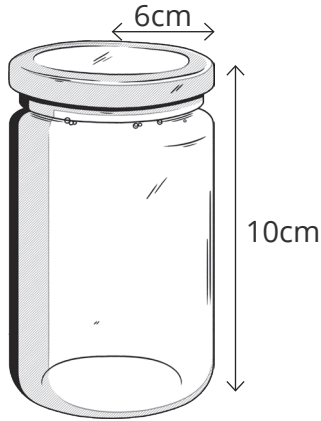


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### Volume of a Cylinder

7. Honey comes in cylindrical jars with a radius of 6cm and a height of 10cm. How many cubic centimetres of honey (to the nearest cubic centimetre) will each jar hold?

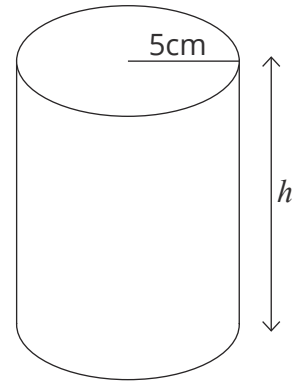


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8. The volume of the cylinder is  $1000\text{cm}^3$ . Calculate the height of the cylinder, giving your answer correct to the nearest centimetre.



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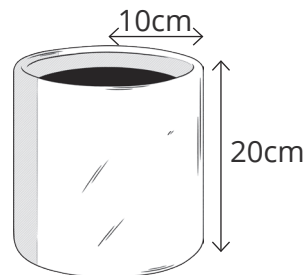
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### Challenge

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1 litre =  $1000\text{cm}^3$



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