

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

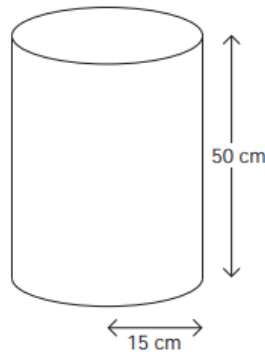
Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Q1.

AtoZrevision.com

A tank is in the shape of a cylinder of radius 15 cm and height 50 cm



Work out the volume of the tank.

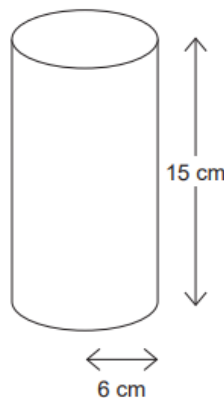
$$\underbrace{\pi \times 15^2}_{(M1)} \times \underbrace{50}_{(M1)} = 11250\pi \text{ cm}^3 \quad (A1)$$

(3 marks)

Q2.

AtoZrevision.com

The diagram shows a cylinder.



The radius of the base is 6 cm.

The height is 15 cm.

Work out the volume.

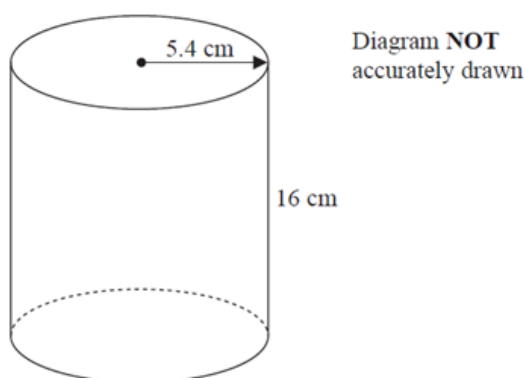
$$\underbrace{\pi \times 6^2}_{(M1)} \times \underbrace{15}_{(M1)} = 540\pi \quad (A1)$$

(3 marks)

Q3.

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A cylinder has radius 5.4 cm and height 16 cm.



Work out the volume of the cylinder.

Give your answer correct to the nearest whole number.

A₁

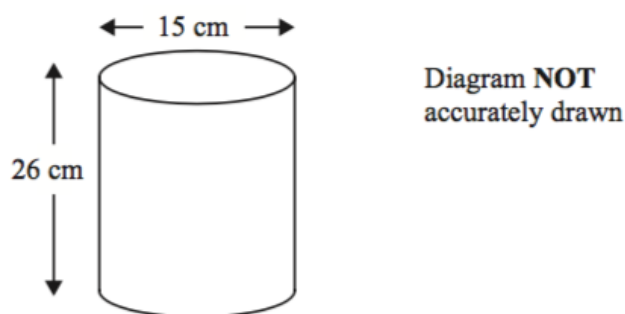
$$\boxed{\pi \times 5.4^2 \times 16 = 1466 \text{ cm}^3}$$

M1

.....
(2 marks)

Q4.

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A cylinder has a diameter of 15 cm and a height of 26 cm.

Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

A₁

$$\boxed{\pi \times (7.5)^2 \times 26 = 4590 \text{ cm}^3}$$

M1 **M1**

.....
(3 marks)

Q5.

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A cylinder has diameter 14 cm and height 20 cm.

Work out the volume of the cylinder. Give your answer correct to 3 significant figures.

$$\left[\pi \times 7^2 \times 20 = 3080 \text{ cm}^3 \right]$$

m₁ *A₁*

.....
(2 marks)

Q6.

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The base of a cylindrical oil tank has an area of 11309.7335 cm^2

The height of the oil tank is 70 cm.

Calculate the volume of the oil tank. Give your answer in litres.

$$\left[11309.7335 \times 70 = 791.68 \text{ l}^3 \right]$$

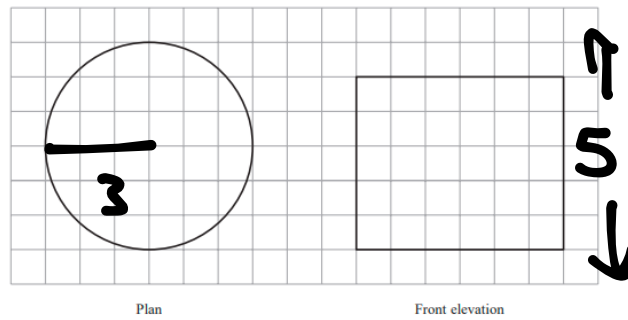
m₁ *A₁*

.....
(2 marks)

Q7.

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The centimetre grid shows the plan and the front elevation of a cylinder.



Work out the volume of the cylinder. Give your answer in terms of π

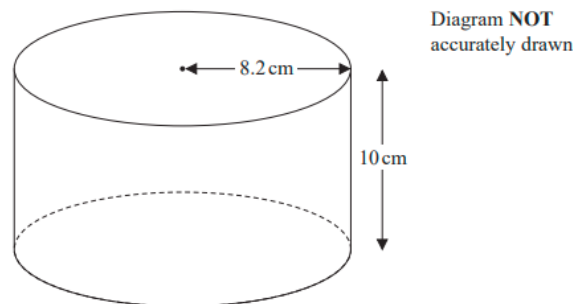
$$\pi \times \underbrace{3^2}_{m_1} \times \underbrace{5}_{m_1} = 45\pi \quad (A_1)$$

(3 marks)

Q8.

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The diagram shows a cylinder.



The cylinder has radius 8.2 cm and height 10 cm. The cylinder is empty.

Pam pours 1.5 litres of water into the cylinder.

Work out the depth of the water in the cylinder.

Give your answer correct to 1 decimal place.

$$(m_1) \quad \pi \times 8.2^2 \times 10 = \frac{3362}{5} \pi \quad (m_1)$$

$$\left[\frac{1.5 \times 1000}{\frac{3362}{5} \pi} = 7.1 \text{ cm}^3 \quad (A_1) \right]$$

(3 marks)

Bronwen decides to place a cylindrical water container in the small paddock on the farm.



The water container has a diameter of 1.4 metres.

$$r = 70 \text{ cm} \quad \text{M1}$$

The water container holds 900 litres of water when full.

$$= 900,000 \text{ cm}^3 \quad \text{M1}$$

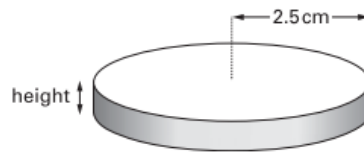
Calculate the height of the water container in centimetres.

$$\left[\frac{900\,000}{\pi \times 70^2} = 58.46 \text{ cm} \right. \quad \text{M1} \quad \text{A1}$$

.....
(4 marks)

A cylinder has a radius of 2.5cm.

The volume of the cylinder, in cm^3 , is 4.5π



What is the height of the cylinder?

$$\cancel{\pi} \times 2.5^2 \times h = 4.5\cancel{\pi} \quad \text{[M1]}$$

$$2.5^2 \times h = 4.5$$

$$\frac{4.5}{2.5^2} = h = 0.72 \text{ cm} \quad \text{[A1]}$$

(2 marks)

A circular table top has radius 70 cm.

The volume of the table top is $17150\pi \text{ cm}^3$.

Calculate the thickness of the table top.

$$\cancel{\pi} \times 70^2 \times T = 17150\cancel{\pi} \quad \text{[M1]}$$

$$70^2 \times T = 17150$$

$$\frac{17150}{70^2} = T = \underline{\underline{3.5 \text{ cm}}} \quad \text{[A1]}$$

(2 marks)

The diagram shows a large tin of pet food in the shape of a cylinder.

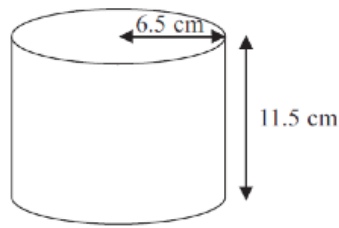


Diagram **NOT**
accurately drawn

The large tin has a radius of 6.5 cm and a height of 11.5 cm.

A pet food company wants to make a new size of tin.

The new tin will have a radius of 5.8 cm.

It will have the same volume as the large tin.

Calculate the height of the new tin.

Give your answer correct to one decimal place.

$$\pi \times 6.5^2 \times 11.5 = 1526.42 \quad (M1)$$

$$(M1) \left[\frac{1526.42}{\pi \times 5.8^2} = 14.44 \text{ cm} \quad (A1) \right]$$

Rhodri studies a cylindrical cell under his microscope.

The height of the cell is 2 microns.

The circumference of the cell is 5 microns.

Calculate the volume of the cell he sees under the microscope.

Give your answer in microns³, correct to 1 significant figure.

$$2 \times \pi \times r = 5 \text{ m}$$

$$\therefore r = \frac{5}{2\pi} \text{ A}$$

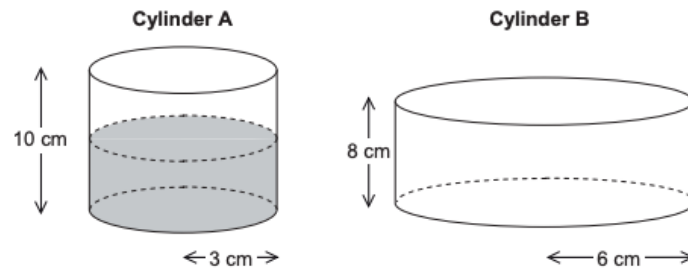
VOLUME:

$$\text{m} \left[\pi \times \left(\frac{5}{2\pi} \right)^2 \times 2 = 3.9 \dots \text{ A} \right]$$

$$= 4 \text{ microns}^3 \text{ A}$$

Cylinder A has radius 3 cm and height 10 cm

Cylinder B has radius 6 cm and height 8 cm



Cylinder A is half full of water.

The volume of water in Cylinder A is $45\pi \text{ cm}^3$.

All the water from Cylinder A is poured into Cylinder B.

Work out the height of the water in Cylinder B.

$$\cancel{\pi} \times 6^2 \times h = 45\cancel{\pi} \quad \text{mi}$$

$$6^2 \times h = 45$$

$$36 \times h = 45$$

$$h = \frac{45}{36} = 1.25 \text{ cm} \quad \text{A1}$$

mi

.....
(3 marks)

A water tank is in the shape of a cylinder.

It has diameter 0.44 m and height 1.2 m.

Water flows into the tank at a rate of 20 litres per minute. 1 litre = 1000 cm³.

John says that it will take about 10 minutes to completely fill the empty tank.

Is he correct?

You must show working to support your answer.

VOLUME :

$$\textcircled{M1} \left[\pi \times 0.22^2 \times 1.2 = 0.18246 \dots \text{m}^3 \right. \\ \left. = 0.182 \text{m}^3 \textcircled{A1} \right]$$

$$\textcircled{M1} \left[\frac{0.182 \times 1000}{20} = 9.12 \text{ mins.} \textcircled{A1} \right]$$

$\therefore$ YES, IT WILL TAKE AROUND

$\textcircled{C1}$ 10 MINUTES TO FILL

Liquid A and liquid B are mixed together in the ratio 2: 13 by volume to make liquid C.

Liquid A has density 1.21 g/cm^3

Liquid B has density 1.02 g/cm^3

A cylindrical container is filled completely with liquid C.

The cylinder has radius 3 cm and height 25 cm.

Work out the mass of the liquid in the container.

Give your answer correct to 3 significant figures.

$$\pi \times 3^2 \times 25 = 225\pi$$

$$= \text{VOLUME OF C}$$

(P1)

VOLUME OF A:

$$225\pi \times \frac{2}{2+13} = 30\pi$$

EITHER
(P1)

VOLUME OF B:

$$225\pi \times \frac{13}{2+13} = 195\pi$$

MASS OF A:

$$30\pi \times 1.21 = 113.982$$

EITHER
(P1)

MASS OF B:

$$195\pi \times 1.02 = 624.56$$

$$113.982 + 624.56 = \underline{738.542} \quad (A1)$$

(4 marks)

PHew!