Name ANSWERS	Class

MATHS TEACHER HUB

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Cylinders

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

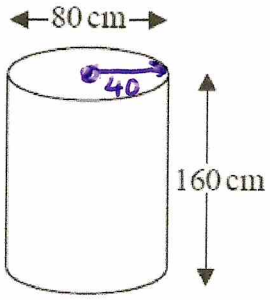
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

24 Karina has 4 tanks on her tractor.
Each tank is a cylinder with diameter 80 cm and height 160 cm.



The 4 tanks are to be filled completely with a mixture of fertiliser and water.

The fertiliser has to be mixed with water in the ratio 1 : 100 by volume.
Karina has 32 litres of fertiliser.

1 litre = 1000 cm^3

Has Karina enough fertiliser for the 4 tanks?
You must show how you get your answer.

Volume = $\pi \times 40^2 \times 160$

$= 804247.7193 cm^3$

4 tanks = 4×804247.7193

$= 3216990.877 cm^3$

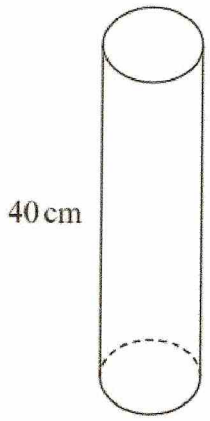
$\div 1000$ = 3216.990 litres

$\frac{3216.99}{101} = 31.8513$

Yes karina has enough $31.85 < 32$

(Total for Question 24 is 4 marks)

27 The diagram shows a solid cylinder on a horizontal floor.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The cylinder has a

volume of 1200 cm^3
height of 40 cm.

The cylinder exerts a force of 90 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

Volume = Area of cross section x depth

$1200cm^3$ =  x 40

$30cm^2$ = 

$\frac{\text{Force}}{\text{Area}} = \frac{90}{30} = 3$

3

..... newtons/cm^2

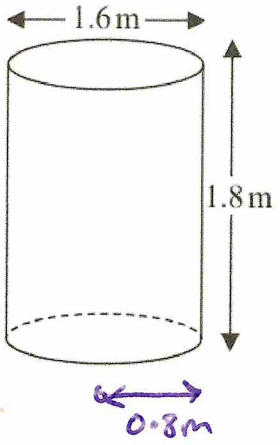
(Total for Question 27 is 3 marks)

29 Jeremy has to cover 3 tanks completely with paint.

Each tank is in the shape of a cylinder with a top and a bottom.
The tank has a diameter of 1.6 m and a height of 1.8 m.

Jeremy has 7 tins of paint.
Each tin of paint covers $5\,m^2$

Has Jeremy got enough paint to cover completely the 3 tanks?
You must show how you get your answer.



Surface area = Top + Bottom + Side

Top: $\pi \times 0.8^2$

Bottom: $\pi \times 0.8^2$

Side: $1.6\pi \times 1.8$, height 1.8, base 1.6π

$\frac{16}{25}\pi + \frac{16}{25}\pi + \frac{72}{25}\pi$

$= \frac{104}{25}\pi$

3 tanks $= \frac{104}{25}\pi \times 3$

$= \frac{312}{25}\pi$ or $39.207076\,m^2$

7 tins $\times 5m^2 = 35m^2$

No Jeremy does not have enough paint to paint all 3 tanks.

(Total for Question 29 is 5 marks)