Name ANSWERS	Class

MATHS TEACHER HUB

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Compound measures

(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.

20 The density of apple juice is 1.05 grams per cm^3.

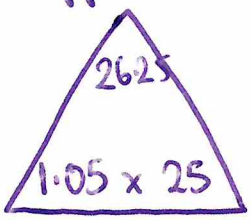
The density of fruit syrup is 1.4 grams per cm^3.

The density of carbonated water is 0.99 grams per cm^3.

25 cm^3 of apple juice are mixed with 15 cm^3 of fruit syrup and 280 cm^3 of carbonated water to make a drink with a volume of 320 cm^3.

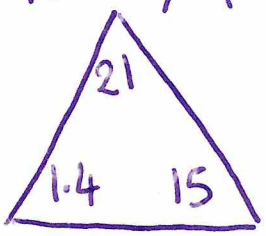
Work out the density of the drink.
Give your answer correct to 2 decimal places.

Apple Juice



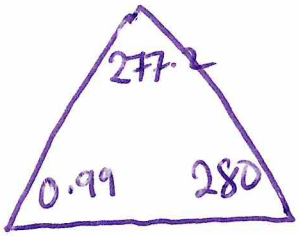
$1.05 \times 25 = 26.25g$

Fruit syrup



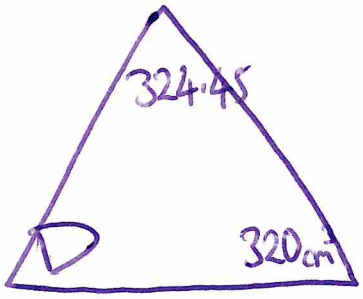
$1.4 \times 15 = 21g$

Carbonated water



$0.99 \times 280 = 277.2g$

Drink



$\frac{324.45}{320} = 1.013906$

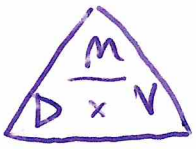
1.01 ..... g/cm^3

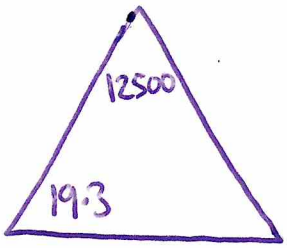
(Total for Question 20 is 4 marks)

21 A gold bar has a mass of 12.5 kg. → 12500g

The density of gold is 19.3 g/cm^3

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





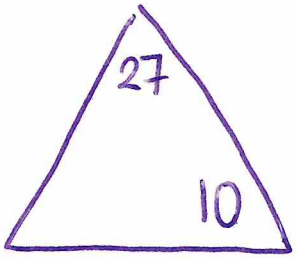
$\frac{12500}{19.3} = 647.6683938 cm^3$

648 cm^3

November 2017 – Paper 3F **(Total for Question 21 is 3 marks)**

25 A piece of glass has a mass of 27 g and a volume of 10 cm^3

Work out the density of the piece of glass.

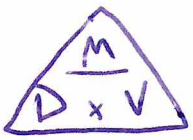


$\frac{27}{10}$

2.7 g/cm^3

November 2023 – Paper 1F **(Total for Question 25 is 2 marks)**

26 Habib has two identical tins.

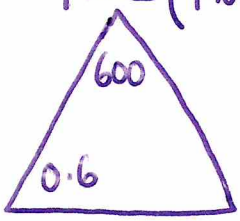


He puts 600 grams of flour into one of the tins.
The flour fills the tin completely.
The density of the flour is 0.6 g/cm^3

Habib puts 600 grams of salt into the other tin.
The salt does **not** fill the tin completely.
The volume of the space in the tin that is **not** filled with salt is 700 cm^3

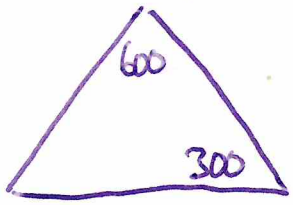
Work out the density of the salt.
You must show all your working.

Tin 1 (Flour)



$\frac{600}{0.6} = 1000 cm^3$

Tin 2 (Salt)

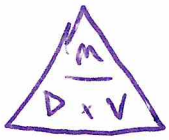


$\frac{600}{300} = 2 g/cm^3$

2 g/cm^3

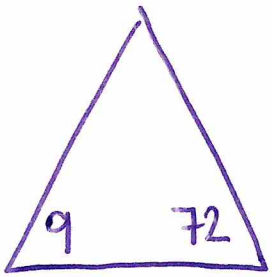
June 2024 – Paper 3F **(Total for Question 26 is 4 marks)**

27 A solid cuboid is made of metal.



The metal has a density of 9 g/cm^3
The volume of the cuboid is 72 cm^3

Work out the mass of the cuboid.

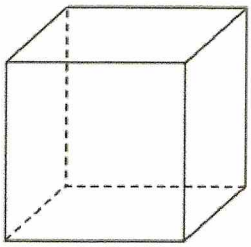


$9 \times 72 = 648 g$

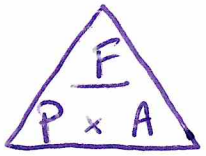
648 g

June 2023 – Paper 3F **(Total for Question 27 is 2 marks)**

27 The diagram shows a solid cube placed on a horizontal table.

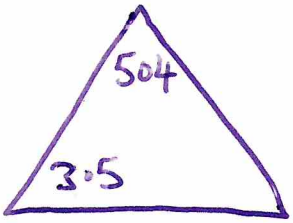


$$\text{pressure} = \frac{\text{force}}{\text{area}}$$



The pressure on the table due to the cube is 3.5 newtons/cm^2
The force exerted by the cube on the table is 504 newtons.

Show that the total surface area of the cube is less than 900 cm^2



$\frac{504}{3.5} = 144\text{cm}^2$

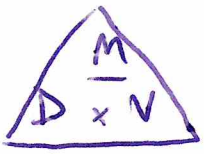
6 sides of a cube

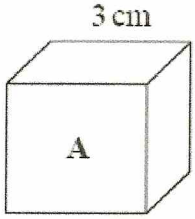
$6 \times 144 = 864\text{cm}^2$

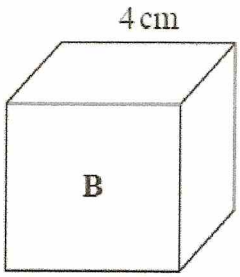
$864 < 900$

(Total for Question 27 is 3 marks)

29 Here are two cubes, **A** and **B**.







$V = 3 \times 3 \times 3$
$= 27 cm^3$

$V = 4 \times 4 \times 4$
$= 64 cm^3$

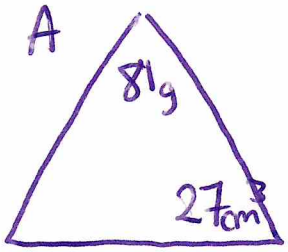
Cube **A** has a mass of 81 g.

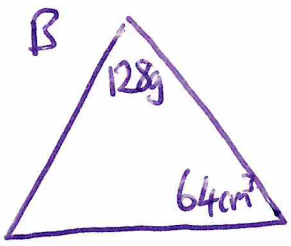
Cube **B** has a mass of 128 g.

Work out

the density of cube **A** : the density of cube **B**

Give your answer in the form $a : b$, where a and b are integers.





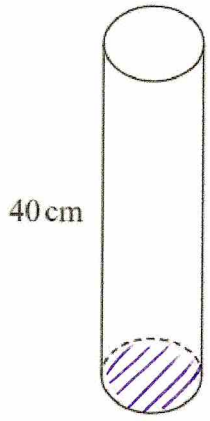
$\frac{81}{27} = \frac{9}{3} = 3 g/cm^3$

$\frac{128}{64} = \frac{64}{32} = \frac{32}{16} = 2 g/cm^3$

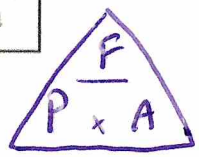
3 : 2

(Total for Question 29 is 3 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.

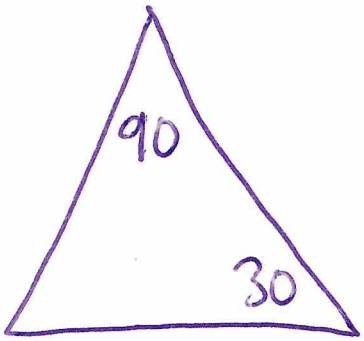
The cylinder exerts a force of 90 newtons on the floor.

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

Volume = cross section x depth

1200 =  x 40

30 = 

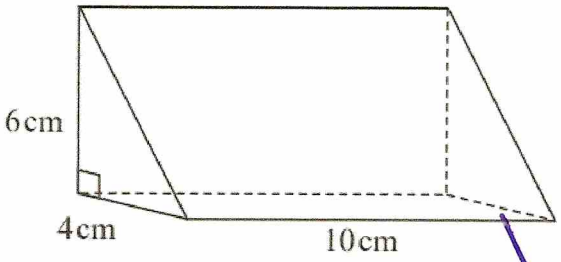


$\frac{90}{30} = 3 n/cm^3$

3 ..... newtons/cm^2

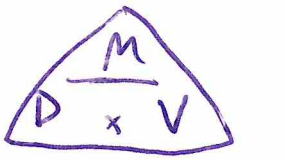
(Total for Question 27 is 3 marks)

29 The diagram shows a solid triangular prism.



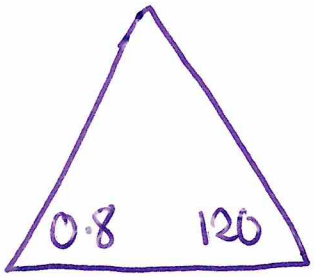
The prism is made from wood with a density of 0.8 g/cm³

Work out the mass of this prism.



Volume = $\frac{6 \times 4}{2} \times 10$

$= 120 cm^3$



$0.8 \times 120 = 96g$

96 g

(Total for Question 29 is 3 marks)