Name	Class

MATHS TEACHER HUB

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Pressure

(9 – 1) Topic booklet

Higher

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 **1H** question you are not allowed to use a calculator.
•If the question is a **2H** or a **3H** 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.

2 A box exerts a force of 140 newtons on a table.
The pressure on the table is 35 newtons/m^2.

Calculate the area of the box that is in contact with the table.

$$p = \frac{F}{A}$$

p = pressure
F = force
A = area

.....

(Total for Question 2 is 3 marks)

6 A force of 70 newtons acts on an area of $20\,cm^2$

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



The force is increased by 10 newtons.
The area is increased by $10\,cm^2$

Helen says,

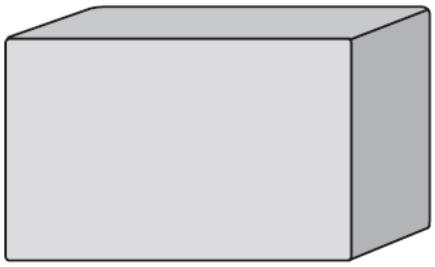
"The pressure decreases by less than 20%"

Is Helen correct?
You must show how you get your answer.

June 2018 – Paper 2H

(Total for Question 6 is 3 marks)

7



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

A storage tank exerts a force of 10 000 newtons on the ground.

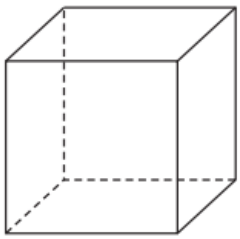
The base of the tank in contact with the ground is a 4 m by 2 m rectangle.

Work out the pressure on the ground due to the tank.

..... newtons / m^2

November 2022 – Paper 1H **(Total for Question 7 is 2 marks)**

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



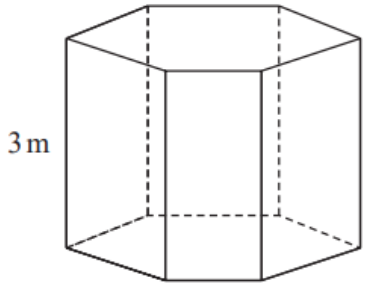
$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

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

(Total for Question 8 is 3 marks)

8 The diagram shows a prism placed on a horizontal floor.



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

The prism has height 3 m
The volume of the prism is 18 m^3

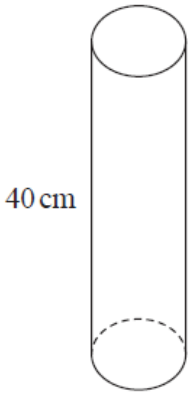
The pressure on the floor due to the prism is 75 newtons/m^2

Work out the force exerted by the prism on the floor.

..... newtons

(Total for Question 8 is 3 marks)

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



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

The cylinder has a

volume of $1200\,\text{cm}^3$
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.

..... newtons/cm^2

(Total for Question 8 is 3 marks)

9 A box in the shape of a cuboid is placed on a horizontal floor.

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

The box exerts a force of 180 newtons on the floor.
The box exerts a pressure of 187.5 newtons/m^2 on the floor.

The face in contact with the floor is a rectangle of length 1.2 metres and width x metres.



Work out the value of x.

$x =$ .....

June 2022 – Paper 2H **(Total for Question 9 is 3 marks)**

12 $\text{Pressure} = \frac{\text{force}}{\text{area}}$

Find the pressure extered by a force of 900 newtons on an area of 60 cm^2.
Give your answer in newtons/m^2.

..... newtons/m^2

Sample 1 – Paper 1H **(Total for Question 12 is 2 marks)**