

Pressure, Force and Area

Please write clearly in block capitals

Forename:

Surname:

Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

1 A system has a pressure of 5 N/m^2 (Level 4)

If a force of 2000 N is applied, what is the area that the force is applied to?

Give the units.

[2 marks]

Answer _____

2 The force applied to a 0.4 m by 0.8 m break pad produces a pressure of 500 N/m^2 . (Level 4)

Calculate the force applied to the break pad.

[2 marks]

Answer _____

3 An object exerts a force of 10 kN on an area of 2 cm^2 . (Level 4)

What is the pressure the object exerts on the surface?

Give the units of pressure.

[1 mark]

Answer _____

Turn over for next question

4 Our atmosphere exerts a pressure of 101 N/m^2 (Level 5)

Calculate the force on one square centimetre caused by the atmosphere.

Give your answer in Newtons to 3 significant figures.

[1 mark]

Answer _____ N

5 A crate in a Warehouse exerts a $10,000 \text{ N}$ force on the floor. (Level 5)

The base of the crate has dimensions of 0.5 m by 3 m .

Calculate the pressure on the warehouse floor caused by the crate.

Give your answer in Newtons to 3 significant figures.

[2 marks]

Answer _____ N

6 A needle requires a force of 0.5 Newtons to puncture the skin. (Level 5)

The tip of the needle has an area of 0.0000001 m^2

Calculate the pressure needed to puncture the skin?

[2 marks]

Answer _____ N/m^2

Turn over for next question

- 7** A coin is dropped off of a building landing on its side. (Level 5)
 It hits with a pressure of $400\text{N}/\text{m}^2$
 It hits with a force of 0.1 N
 Calculate the area of the coin?

[2 marks]

Answer _____

- 8** A cylinder stands on the circular end. (Level 5)
 The cylinder exerts a force of 2 N onto the floor.
 The cylinder has a radius of 0.5 m
 Calculate the pressure the cylinder exerts on the floor.
 Give your answer to 3 significant figures.

[2 marks]

Answer _____



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