KS3 SCIENCE · PHYSICS

Pressure, moments and stretching: exam questions

Name _____
Total: 21 marks

1 A crate weighs 900 N. The area of its base is 3 m². Calculate the pressure it puts on the floor. Give the unit. **[2 marks]**

2 Explain why a sharp knife cuts more easily than a blunt one. **[2 marks]**

3 Describe how the pressure in a liquid changes as you go deeper, and explain why. **[2 marks]**

4 A block of wood floats on water. A stone sinks. For each one, compare its weight with the upthrust on it. **[2 marks]**

5 Explain why atmospheric pressure is lower at the top of a mountain than at sea level. **[2 marks]**

6 A spring is 6 cm long. With a 4 N weight hanging on it, it is 14 cm long. (a) Calculate the extension. (b) The spring follows Hooke's law. Give the extension with a 2 N weight. **[2 marks]**

7 A force of 30 N pushes down on a spanner, 0.2 m from the nut. Calculate the moment of the force. Give the unit. **[2 marks]**

8 A child who weighs 500 N sits 2 m to the left of the pivot of a see-saw. A child who weighs 400 N sits 2.5 m to the right. Use moments to show whether the see-saw balances. **[3 marks]**

9 A force of 40 N pushes a trolley 6 m. Calculate the work done. Give the unit. **[2 marks]**

10 Explain how a lever makes it easier to lift a heavy load. **[2 marks]**

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Pressure, moments and stretching: mark scheme

Total: 21 marks

1 [2 marks]
- 900 ÷ 3 = 300 **(1)**
- N/m² (accept: newtons per square metre, or pascals) **(1)**

2 [2 marks]
- The sharp edge has a smaller area (touching the food) **(1)**
- So the same force gives a bigger pressure **(1)**

3 [2 marks]
- The pressure increases with depth **(1)**
- There is more liquid above, and its weight presses down **(1)**

4 [2 marks]
- Wood: the upthrust equals its weight (accept: the forces are balanced) **(1)**
- Stone: its weight is bigger than the upthrust **(1)**

5 [2 marks]
- Atmospheric pressure is caused by the weight of the air above **(1)**
- At the top of a mountain there is less air above (so less weight presses down) **(1)**

6 [2 marks]
- (a) 14 − 6 = 8 cm **(1)**
- (b) 4 cm (half the force gives half the extension) **(1)**

7 [2 marks]
- 30 × 0.2 = 6 **(1)**
- N m (newton metres) **(1)**

8 [3 marks]
- Anticlockwise moment = 500 × 2 = 1000 N m **(1)**
- Clockwise moment = 400 × 2.5 = 1000 N m **(1)**
- The moments are equal, so it balances **(1)**

9 [2 marks]
- 40 × 6 = 240 **(1)**
- J (joules) **(1)**

10 [2 marks]
- You can use a smaller force than the weight of the load **(1)**
- But your force has to move through a bigger distance than the load moves **(1)**