Name:

Exam Style Questions

Pressure

Corbettmaths

Equipment needed: Pen, Calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 385

Answers and Video Solutions

1. Find the pressure exerted by a force of 8000 newtons on an area of $25m^2$.
Give your answer in newtons/m^2

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

$$\frac{8000}{25}$$

$$25\overline{)8000}$$

320 .....newtons/m^2

(2)

---

2. A crate exerts a force of 120 newtons on a table.
The pressure on the table is 15 newtons/m^2.

Calculate the area of the crate that is in contact with the table.
Include suitable units.

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

$$= \frac{120}{15} = 8$$

$8m^2$ .....

(3)

---

3. A box is placed on the floor.

The area of the box in contact with the floor is $2.4m^2$
The pressure exerted on the floor is 16 newtons/m^2

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

$$F = P \times A$$

$$= 16 \times 2.4$$

38.4 .....N

(2)

---

4. An object is placed on a table.
It exerts a force of 22 newtons on the table.

The pressure on the table is 500 newtons/m^2
Calculate the area of the crate that is in contact with the table.
Include suitable units.

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

$$\frac{22}{500} = 0.044m^2$$

or $440cm^2$

$0.044m^2$

or $440cm^2$ .....

(3)

5. Find the pressure exerted by a force of 240 newtons on an area of 30cm².
Give your answer in newtons/m²

$30 \div 10000 = 0.003 m^2$

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

$= \frac{240}{0.003}$

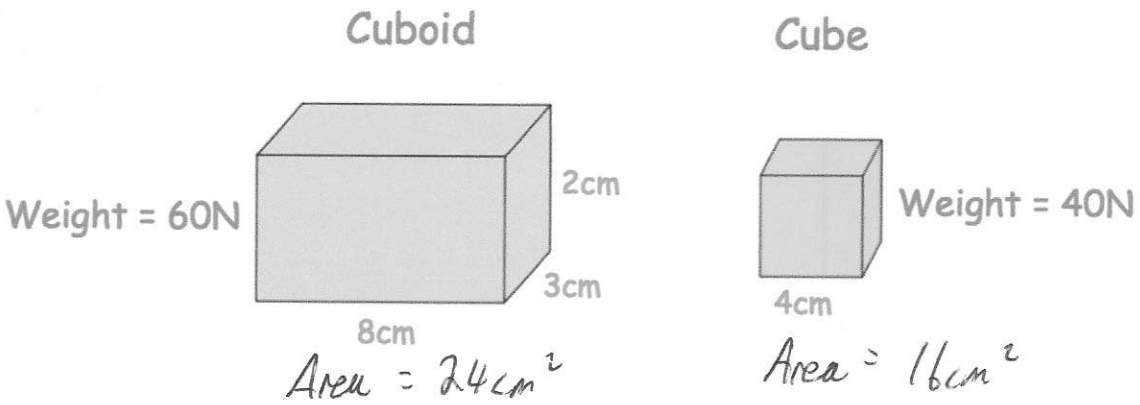
80000 .....newtons/m²

(2)

---

6. The cuboid and the cube below are placed on the floor.

The cuboid has a weight of 60N
The cube has a weight of 40N



Area = $24cm^2$

Area = $16cm^2$

Which exerts a greater pressure on the ground?
You must show your working.

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

Cuboid $P = \frac{60}{0.0024} = 25000 N/m^2$

Cube $P = \frac{40}{0.0016} = 25000 N/m^2$

They exert the same pressure

(4)

7. A television is placed on a table.

The area of the television in contact with the table is 750cm²
The pressure on the table is 1760 newtons/m².

$0.075m^2$

Work out the force exerted by the television on the table.

$F = P \times A$

$= 1760 \times 0.075$

132 .....N

(3)

---

8. A cuboid trunk is placed on a table.

The trunk exerts a pressure of 150 newtons/m² on the table.
The trunk exerts a force of 900 newtons on the table.

The trunk has a width of 1.5m
The trunk has a height of 0.8m from the table.

Calculate the volume of the trunk

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

$= \frac{900}{150}$

$= 6m^2$

$6 \div 1.5 = 4m$ (length)

$4 \times 1.5 \times 0.8 = 4.8m^3$

4.8 .....m³

(4)

9. A cylinder is placed on the ground.
The cylinder has a weight of 85N and a radius of 2cm.

Work out the pressure on the ground in newtons/cm²

Area $= \pi \times 2^2$

$= 12.5664 cm^2$

$0.00125664 m^2$

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

$\frac{85}{12.5664} = 6.764 N/cm^2$

6.764 ..... N/cm²

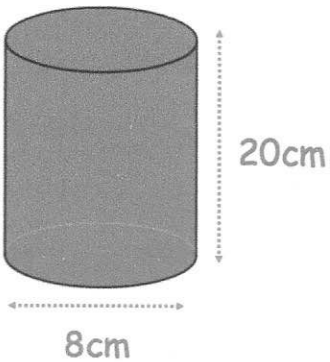
(4)

---

10. A lead rod is placed on a table.
The rod is a cylinder with diameter 8cm and height 20cm.

The force exerted on the table is 111.72 newtons.

Work out the pressure in newtons/m²



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

$= \frac{111.72}{0.00502...} = 22225.99$

Area $= \pi \times 4^2$

$= 50.26... cm^2$

$= 0.005026...$

22225.99 ..... newtons/m²

(4)

11. The pressure of a tyre is 34 pounds per square inch.

Given 1 pound = 0.4536 kilograms

1 inch = 2.54 centimetres

Work out the pressure in grams per square centimetre.

$2.54^2 = 6.4516$

34 lb/in²

× 0.4536 ↓

15.4224 kg/in²

× 1000 ↓

15422.4 g/in²

÷ 6.4516 ↓

2390.4762...

2390.48 g/cm²

(3)

---

12. The pressure of a football is 500 grams per square centimetre.

Given 1 pound = 0.4536 kilograms

1 inch = 2.54 centimetres

$2.54^2 = 6.4516$

Work out the pressure in pounds per square inch.

500 g/cm²

× 6.4516 ↓

3225.8 g/in²

÷ 1000 ↓

3.2258 kg/in²

÷ 0.4536 ↓

7.11155... lb/in²

7.1116 psi

(3)

13. A square based pyramid, with a perpendicular height of 15cm is placed on a table.

The weight of the pyramid is 70.56N

The pyramid exerts a pressure of 4900N/m² on the table.

Work out the volume of the square based pyramid.

$A = \frac{F}{P} = \frac{70.56}{4900} = 0.0144 m^2$

$144 cm^2$

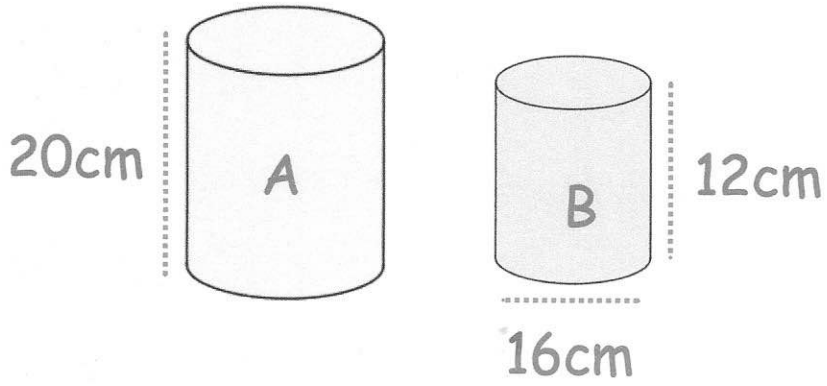
$V = \frac{1}{3} \times A \times h$

$= \frac{1}{3} \times 144 \times 15$

720 .....cm³

(5)

14. Containers A and B are placed on a shelf.
Both containers are cylinders.



The pressure on the shelf from container B is 3 newtons/cm²

The volume of A : volume of B = 5 : 4
The force exerted by A : force exerted by B = 10 : 7

Work out the pressure on the shelf due to container A.

(base) Area of B $\pi \times 8^2$

64π

Volume of B = 768π cm³

Volume of A = 960π cm³

$768\pi \div 4 = 192\pi$

$192\pi \times 5 = 960\pi$

(base) Area of B $960\pi \div 20 = 48\pi$ cm²

B $F = 3 \times 64\pi$

$= 192\pi$ N

$192\pi \div 7 = 86.169...$

$86.169... \times 10 = 861.69...$

A $P = \frac{861.69...}{48\pi} = \frac{40}{7}$

5.7142...

5.7143 ..... newtons/cm²

(5)