Name:

Exam Style Questions

Pressure

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 385

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

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

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

320 ..... newtons/m^2

(2)

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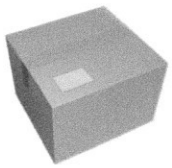
2. A crate exerts a force of 120 newtons on a table.
The pressure on the table is 15 newtons/m^2.



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

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

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

$8m^2$ .....

(3)

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3. A box is placed on the floor.

The area of the box in contact with the floor is $2.4m^2$
Pressure exerted on the floor 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)

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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.

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

$$= \frac{22}{500} = 0.044m^2 \text{ or } 440cm^2$$ .....

(3)

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

$30 \div 10000 = 0.003 m^2$

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

$= \frac{240}{0.003}$

80000 ..... newtons/m²

(2)

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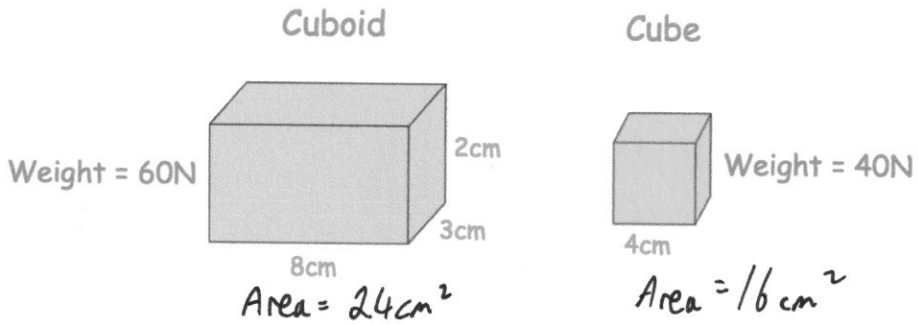
6. The cuboid and the cube below are placed on the floor.

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



Area = $24cm^2$

Area = $16 cm^2$

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. $0.075m^2$
The pressure on the table is 1760 newtons/m².

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

$F = P \times A$

$= 1760 \times 0.075$

132 .....N

(3)

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8. A cylinder is placed on the ground.
The cylinder has a weight of 85N and has 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

(3)

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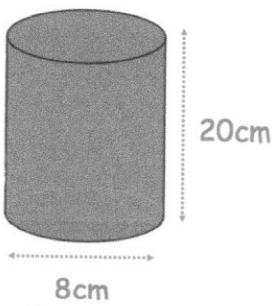
9. A lead rod is placed on a table.
The rod is a cylinder with diameter 8cm and height 20cm.

The force exerted on the table is 111.72 newtons.

Work out the pressure in newtons/m²



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

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

Area $= \pi \times 4^2$
$= 50.26... cm^2$
$= 0.005026...$

22225.99 ..... newtons/m²

(4)

10. 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.

$\times 0.4536$ ↓ 34 lbs/in²
15.4224 kg/in²
$\times 1000$ ↓
15422.4 g/in²
$\div 6.4516$ ↓
2390.48

$2.54^2 = 6.4516$ cm²

2390.48 .....g/cm² **(3)**

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

Given 1 pound = 0.4536 kilograms
1 inch = 2.54 centimetres

Work out the pressure in pounds per square inch.

$2.54^2 = 6.4516$

$\times 6.4516$ ↓ 500 g/cm²
3225.8 g/in²
$\div 1000$ ↓
3.2258 kg/in²
$\div 0.4536$ ↓
7.111..

7.111 lb/in² .....psi **(3)**

12. 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)**