

Activity 1

Use the mark scheme to mark these 5 attempts at Q14 - a mathematical problem.

A

13 The diagram shows a solid cube.

The cube is placed on a table so that the whole of one face of the cube is in contact with the table.

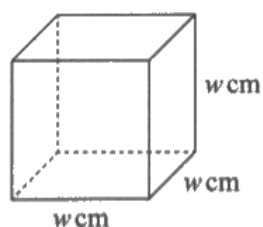


Diagram NOT accurately drawn

$$\text{Vol} = w \times L \times h$$

The cube exerts a force of 56 newtons on the table.

The pressure on the table due to the cube is 0.14 newtons/cm²

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

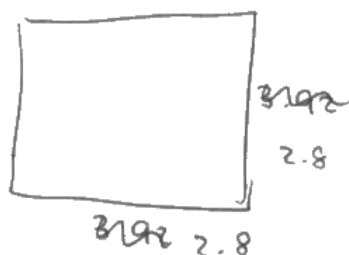


Work out the volume of the cube.

$$\frac{56}{0.14} = 7.84$$

Area of 1 face = 7.84

3.92



$$2.8^3 = 21.952 \\ = 22 \text{ cm}^3$$

22 cm³

B

13 The diagram shows a solid cube.

The cube is placed on a table so that the whole of one face of the cube is in contact with the table.

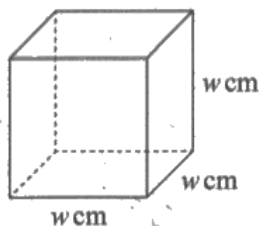


Diagram NOT
accurately drawn

The cube exerts a force of 56 newtons on the table.

The pressure on the table due to the cube is $0.14 \text{ newtons/cm}^2$

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

Work out the volume of the cube.

$$0.14 = \frac{56}{\text{area}}$$

$$\text{Let area} = x$$

$$\text{Area} = w^2 + w^2 + w^2 + w^2 + w^2 + w^2$$

$$0.14x = 56$$

$$\therefore \text{Area} = 6w^2$$

$$x = 400 \text{ cm}^2$$

$$400 = 6w^2$$

$$\frac{400}{6} = w^2$$

$$w = \pm \sqrt{\frac{400}{6}} = 8.164965809 \text{ cm}$$

$$\because w \neq -ve, w = 8.164965809 \text{ cm}$$

$$8.164965809^3 = 544.331054 \text{ cm}^3$$

$$544.33 \text{ cm}^3$$

C

13 The diagram shows a solid cube.

The cube is placed on a table so that the whole of one face of the cube is in contact with the table.

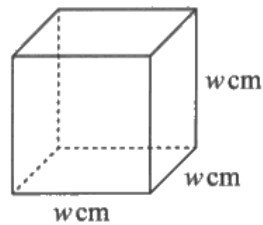


Diagram **NOT**
accurately drawn

The cube exerts a force of 56 newtons on the table.

The pressure on the table due to the cube is 0.14 newtons/cm²

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

Work out the volume of the cube.

$$0.14 = \frac{56}{w^2}$$

$$0.14w^2 = 56$$

$$w^2 = \frac{56}{0.14}$$

$$w^2 = 40$$

$$w = \sqrt{40}$$

$$\sqrt{40^3} = 252.98$$

$$252.98$$

cm³

D

13 The diagram shows a solid cube.

The cube is placed on a table so that the whole of one face of the cube is in contact with the table.

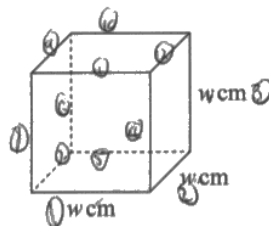


Diagram NOT
accurately drawn

The cube exerts a force of 56 newtons on the table.

The pressure on the table due to the cube is 0.14 newtons/cm²

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

Work out the volume of the cube.

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

$$\frac{f}{P \times A}$$

$$0.14 = \frac{56}{\text{area}}$$

$$\text{area} = \frac{56}{0.14} = 400$$

$$400/12 = 33.3 \text{ cm}^2 \text{ per face}$$

$$400 \text{ cm}^2 = 12W \text{ cm}$$

$$W = 33.3$$

$$W \times W = \sqrt{33.3 \text{ cm}^2}$$

$$W = 18.2$$

$$V = W \times W \times W = W^3$$

$$5.7735 = 182.45$$

$$2W = 37.4$$

$$W = 18.7$$

$$182.45 \text{ cm}^3$$

(Total for Question 13 is 4 marks)

E

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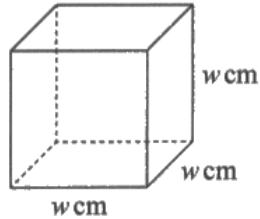


Diagram **NOT** accurately drawn

The cube exerts a force of 56 newtons on the table.

The pressure on the table due to the cube is 0.14 newtons/cm²

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

Work out the volume of the cube.

$$0.14 = \frac{56}{x^2}$$

$$x^2 = 0.14 \times 56 = 7.84$$

$$x \times x = 7.84$$

$$\sqrt{7.84} = 2.8$$

$$2.8 \times 2.8 \times 2.8 = 21.952$$

21.952 cm³