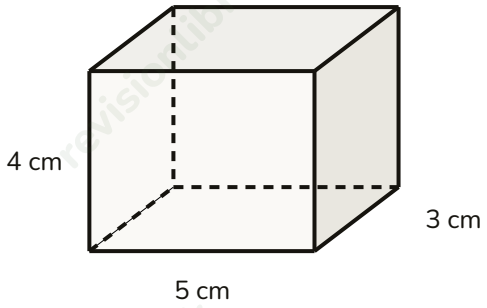
4.12 Volume and Surface Area of Prisms: Test Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Calculate the volume of a cuboid with length 5 cm, width 3 cm and height 4 cm. Give your answer in cubic centimetres.

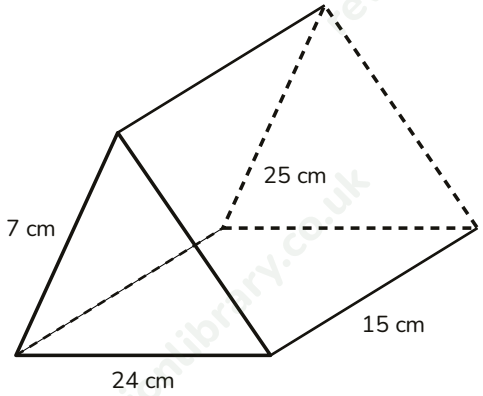


(1)

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2 A triangular prism has triangular end with sides 7 cm, 24 cm and 25 cm. The triangular area is needed to find the volume. First show that the triangle is right-angled, then find the volume of the prism with length 15 cm. Give your answer in cm3.

Diagram NOT accurately drawn



(3)

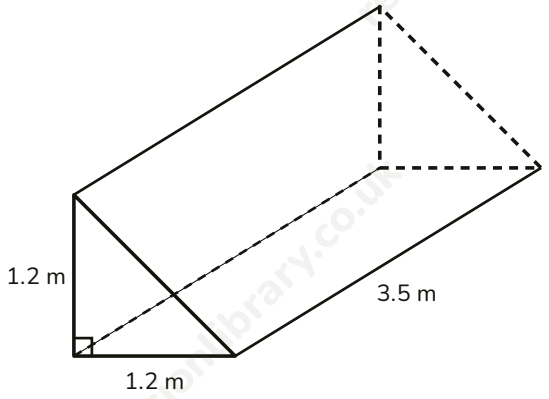
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3 A manufacturer makes open-top rectangular boxes by cutting squares from the corners of a 30 cm by 20 cm card and folding up the sides. The squares cut out have side x cm. Write an expression for the volume of the box in terms of x and then find the volume when x = 3 cm.

(2)

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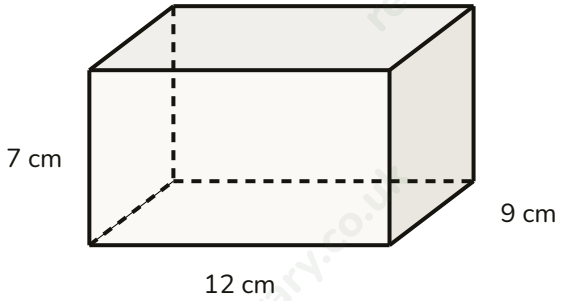
4 Stretch question. A water trough is a right triangular prism with cross section an isosceles right triangle (two equal sides). The equal sides are 1.2 m long and form the legs. The trough is 3.5 m long. Calculate the capacity in litres. Give your answer to the nearest litre. (1 m^3 = 1000 L)



(4)

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5 A cuboid measures 12 cm by 9 cm by 7 cm. Work out its volume.



(2)

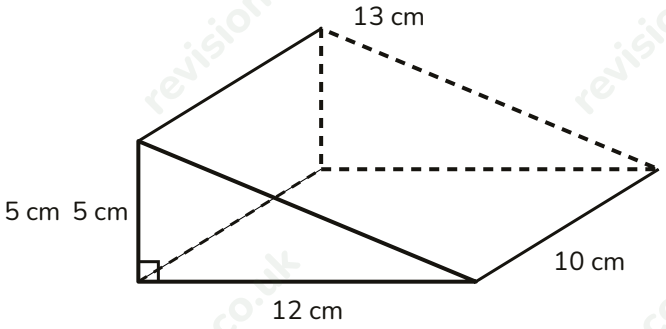
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6 A tank is 62 cm long and 32 cm wide. Water is poured into it to a depth of 8 cm. How many litres of water are in the tank? (1 litre = 1000 cm^3)

(3)

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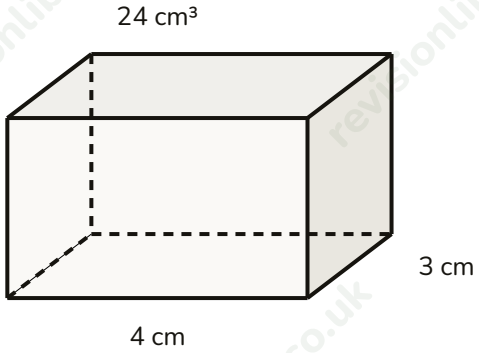
7 A triangular prism has a right-angled triangle as its cross-section. The triangle has sides 5 cm, 12 cm and 13 cm (the longest side is 13 cm). The prism is 10 cm long. Work out the total surface area.



(4)

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8 A cuboid has volume 24 cm³. Its length is 4 cm and its width is 3 cm. Work out its height.



(3)

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9 Convert 150000 cm² into m^2.

(2)

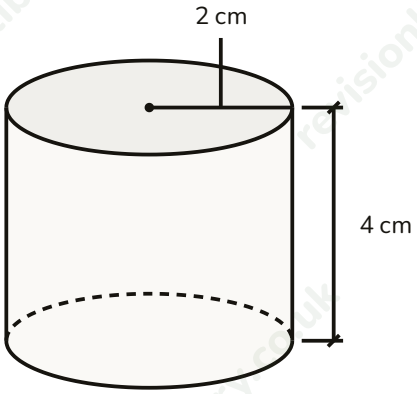
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10 A fish tank is 53 cm long, 32 cm wide and 23 cm high. How many litres of water does it hold when it is full? (1 litre = 1000 cm³)

(3)

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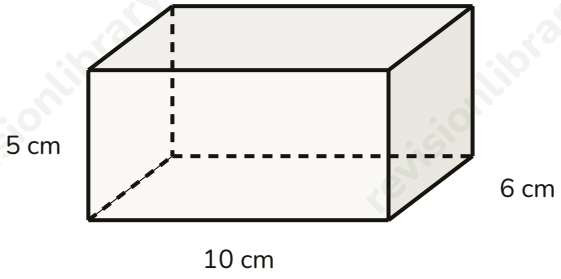
11 A cylinder has radius 2 cm and height 4 cm. Work out its volume in terms of π.



(3)

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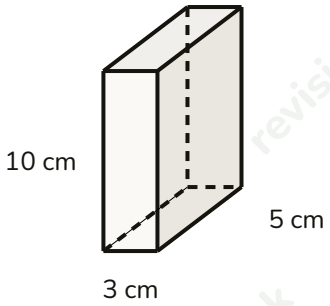
12 A cuboid measures 10 cm by 6 cm by 5 cm. Work out its total surface area.



(3)

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13 A cuboid measures 3 cm by 5 cm by 10 cm. Work out its volume in cm^3 and in litres.

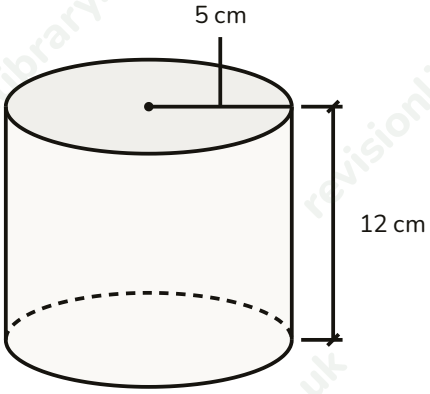


(3)

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14 Calculate the volume of a cylinder approximated as a prism, using area of circular cross-section. A cylinder has radius 5 cm and height 12 cm. Use π = 3.14.

Diagram NOT accurately drawn

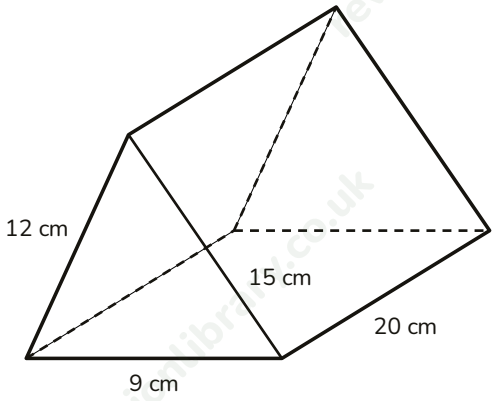


(2)

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15 A triangular prism has a triangular end with sides 9 cm, 12 cm and 15 cm. The prism is 20 cm long. Show that the triangular end is right-angled, then calculate the volume of the prism.

Diagram NOT accurately drawn

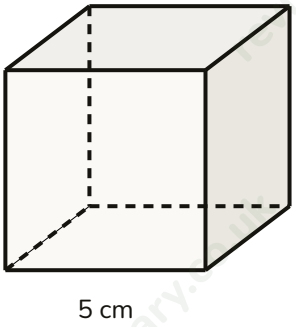


(3)

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16 Find the total surface area of a cube with side length 5 cm.

Diagram NOT accurately drawn



(1)

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17 Convert 4200 cm^3 to litres.

(1)

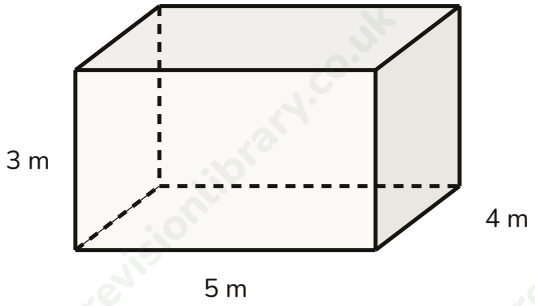
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18 Write down the number of faces of a triangular prism.

(1)

19 Find the total surface area of a cuboid with dimensions 3 m by 4 m by 5 m.

Diagram NOT accurately drawn



(2)

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Mark scheme · 4.12 Volume and Surface Area of Prisms: Test Pack

Question 1

60 cm³ cao	B1

Answer: **60 cm³**

Question 2

show Pythagoras: $7^2 + 24^2 = 49 + 576 = 625 = 25^2$	M1
area of triangle = 1/2 x 7 x 24 = 84 cm²	M1
volume = 84 x 15 = 1260 cm³ cao	A1

Answer: **1260 cm³**

Question 3

expression for dimensions after cutting: (30 - 2x)(20 - 2x)(x) so volume = x(30 - 2x)(20 - 2x)	M1
when x=3: volume = 3 x 24 x 14 = 1008 cm³ cao	A1

Answer: **x(30 - 2x)(20 - 2x); 1008 cm³**

Question 4

area triangle = 1/2 x leg x leg = 1/2 x 1.2 x 1.2 = 0.72 m²	M1
volume = area x length = 0.72 x 3.5 = 2.52 m³	M1
convert to litres: 2.52 x 1000 = 2520 L	M1
capacity = 2520 L to nearest litre cao	A1

Answer: **2520 L**

Question 5

12 x 9 x 7	M1
756 cm³ cao	A1

Answer: **756 cm³**

Question 6

62 x 32 x 8	M1
÷ 1000	M1
15.872 litres cao	A1

Answer: **15.872 litres**

Question 7

two triangles: 2 x 1/2 x 5 x 12 = 60	M1
perimeter of triangle x length: 30 x 10	M1
adds the triangles and the rectangles	M1
360 cm² cao	A1

Answer: **360 cm²**

Question 8

4 x 3 = 12	M1
24 ÷ 12	M1
2 cm cao	A1

Answer: **2 cm**

Question 9

150000 ÷ 10 000	M1
15 m² cao	A1

Answer: **15 m²**

Question 10

53 x 32 x 23 = 39008	M1
39008 ÷ 1000	M1
39.008 litres cao	A1

Answer: **39.008 litres**

Question 11

$\pi \times 2^2$	M1
x 4	M1
16 π cm³ cao	A1

Answer: **16 π cm³**

Question 12

area of at least two different faces found	M1
all three pairs of faces: 2(60) + 2(50) + 2(30)	M1
280 cm² cao	A1

Answer: **280 cm²**

Question 13

3 x 5 x 10	M1
150 cm³	A1
0.15 litres	A1

Answer: **150 cm³, 0.15 litres**

Question 14

cross-section area $3.14 \times 5^2 = 78.5$	M1
942 cao	A1

Answer: **942 cm³**

Question 15

show $9^2 + 12^2 = 81 + 144 = 225 = 15^2$, confirming a right angle	M1
find triangle area, 0.5 x 9 x 12 = 54	M1
1080 cao	A1

Answer: **1080 cm³**

Question 16

150 cao	B1

Answer: **150 cm²**

Question 17

4.2 cao	B1

Answer: **4.2 litres**

Question 18

5 cao	B1

Answer: **5**

Question 19

2(3x4 + 3x5 + 4x5) or equivalent method	M1
94 cao	A1

Answer: **94 m²**

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