

Starter

Contents

Questions and short answers



▶ Starter 1

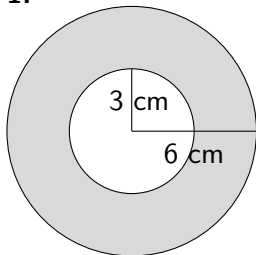
Worked solutions



▶ Starter 1

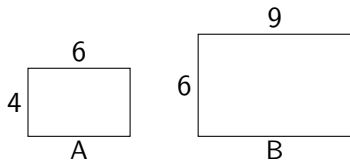
Starter 1

1.



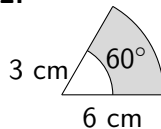
Find the shaded area.

3.



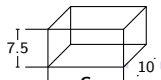
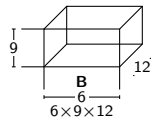
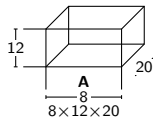
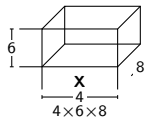
Find the scale factor mapping

2.



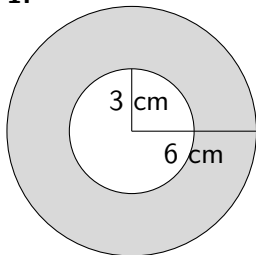
Find the shaded area.

4.



Starter 1

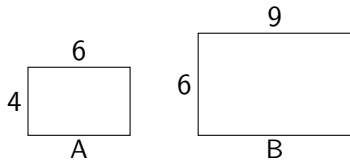
1.



Find the shaded area.

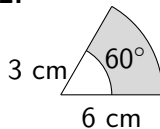
$$\text{Area} = 27\pi \text{ cm}^2$$

3.



Find the scale factor mapping

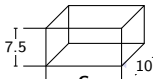
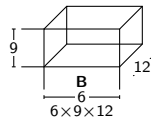
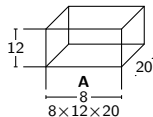
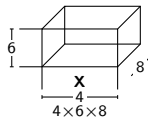
2.



Find the shaded area.

$$\frac{1}{6} \times 27\pi = 4.5\pi \text{ cm}^2$$

4.



Worked Solution: Starter 1, Question 1

Question: A ring is formed by two concentric circles. The outer circle has radius 6 cm and the inner circle has radius 3 cm. Find the shaded area.

Worked Solution:

The shaded area is the area of the large circle minus the area of the small circle:

$$\pi(6)^2 - \pi(3)^2 = 36\pi - 9\pi = 27\pi.$$

Therefore the shaded area is

$$\boxed{27\pi \text{ cm}^2}.$$

Worked Solution: Starter 1, Question 2

Question: A shaded annular sector has outer radius 6 cm, inner radius 3 cm, and angle 60° . Find the shaded area.

Worked Solution:

The full ring has area

$$\pi(6)^2 - \pi(3)^2 = 27\pi.$$

The shaded region is the sector with angle 60° , which is

$$\frac{60}{360} = \frac{1}{6}$$

of the full ring. Hence

$$\text{shaded area} = \frac{1}{6}(27\pi) = \frac{27}{6}\pi = \frac{9}{2}\pi = 4.5\pi \text{ cm}^2.$$

So the shaded area is

$$\boxed{4.5\pi \text{ cm}^2}.$$

Worked Solution: Starter 1, Question 3

Question: Rectangle A has dimensions 6 by 4. Rectangle B has dimensions 9 by 6. Find the scale factor mapping $A \rightarrow B$.

Worked Solution:

The width changes from 6 to 9, so

$$k = \frac{9}{6} = 1.5.$$

The height changes from 4 to 6, so

$$k = \frac{6}{4} = 1.5.$$

Both dimensions are multiplied by the same factor, so the scale factor mapping A to B is

$$\boxed{1.5}.$$

Worked Solution: Starter 1, Question 4

Question: Cuboid X has dimensions $4 \times 6 \times 8$. Decide which of cuboids A , B , C , D are similar to X :

$$A = 8 \times 12 \times 20, \quad B = 6 \times 9 \times 12, \quad C = 5 \times 7.5 \times 10, \quad D = 3 \times 4.5 \times 6.$$

Worked Solution:

Cuboid X has side ratio

$$4 : 6 : 8 = 2 : 3 : 4.$$

A cuboid is similar to X if its side lengths have the same ratio.

cuboid	dimensions	ratio	similar to X
A	8, 12, 20	2 : 3 : 5	No
B	6, 9, 12	2 : 3 : 4	Yes
C	5, 7.5, 10	2 : 3 : 4	Yes
D	3, 4.5, 6	2 : 3 : 4	Yes

So the cuboids similar to X are

B, C, D .