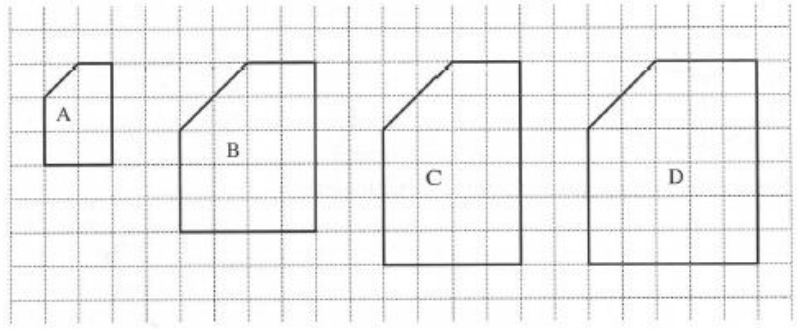
Similar Shapes

Exercise A

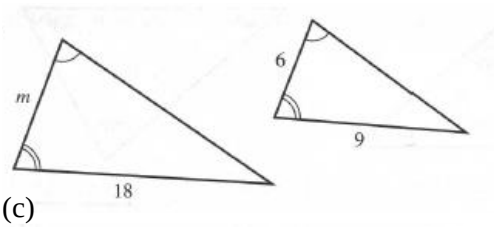
1.

Which of the shapes B, C, D is/are similar to shape A?

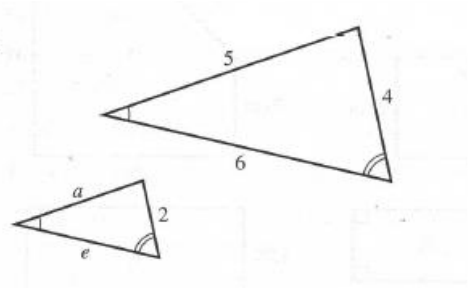


2. In each of the following shapes find the sides marked with letters. All lengths are given in cm. The pairs of shapes are similar.

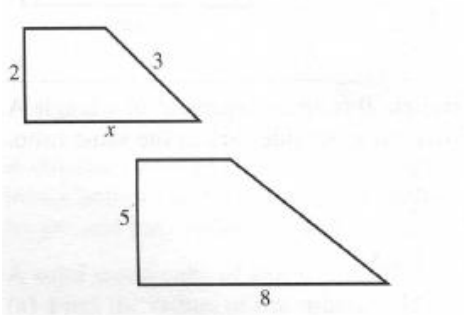
(a)



(b)

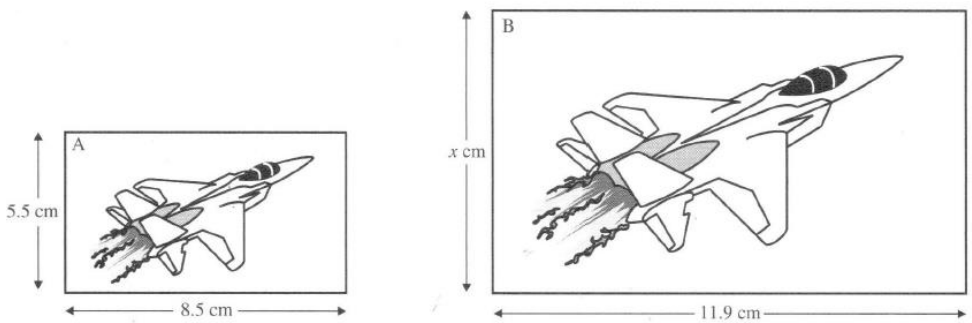


(c)



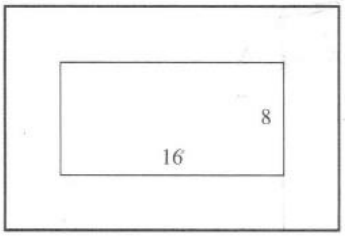
3.

Picture B is an enlargement of picture A. Calculate the length x.



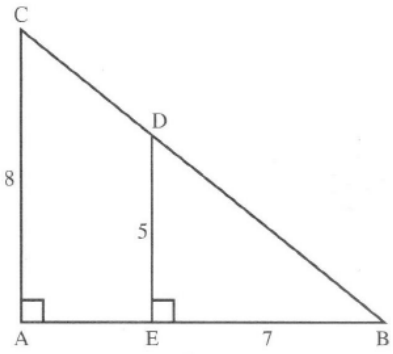
4.

The drawing shows a rectangular picture 16 cm × 8 cm surrounded by a border of width 4 cm.
Are the two rectangles similar?



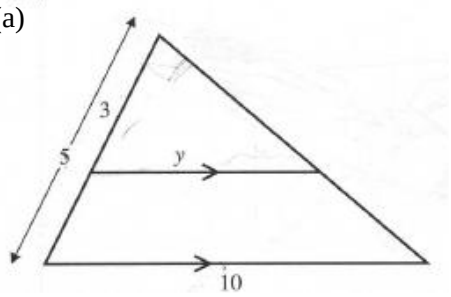
5.

(a) Explain why triangles ABC and EBD are similar.
(b) Given that EB = 7 cm, calculate the length AB.
(c) Write down the length AE.

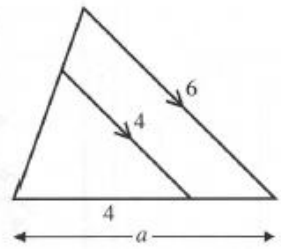


6. Use similar triangles to find the lengths marked with letters.

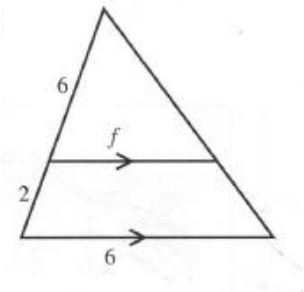
(a)



(b)



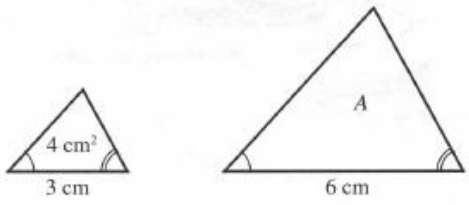
(c)



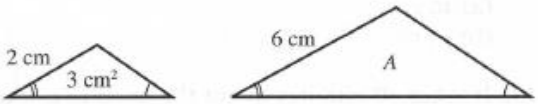
Exercise B

In this exercise, a number written inside a figure represents the area of the shape in cm^2. Numbers on the outside give linear dimensions in cm. In each case the shapes are similar. In Questions **1** to **6**, find the unknown area A.

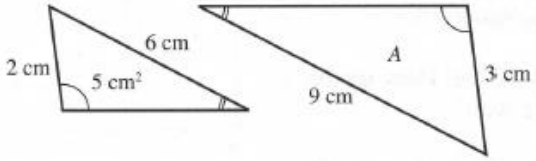
1.



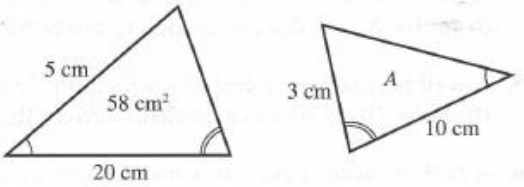
2.



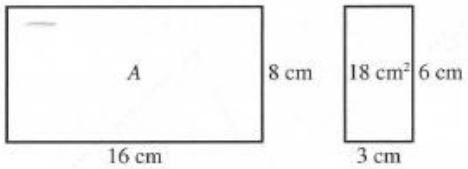
3.



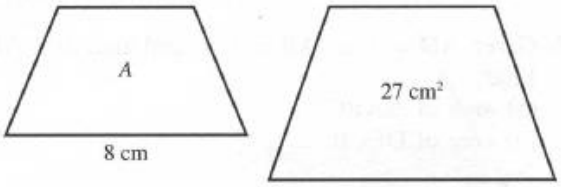
4.



5.



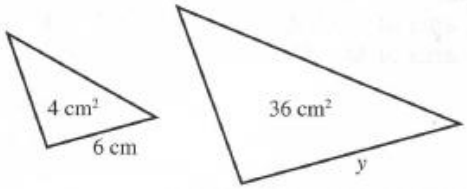
6.



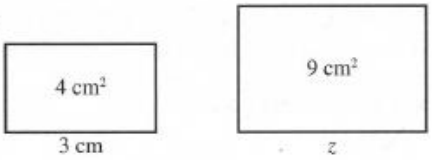
In Questions **7** to **10**, find the lengths marked for each pair of similar shapes.

7.

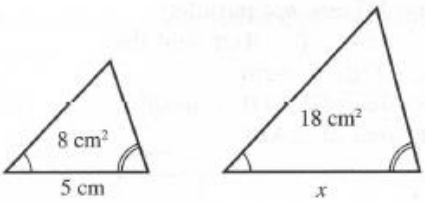
8.



9.



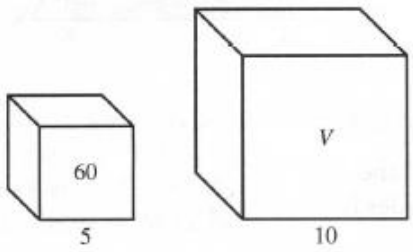
10.



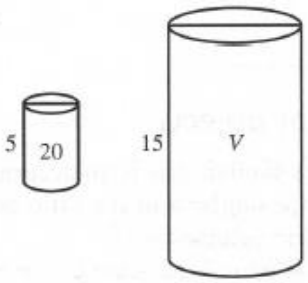
Exercise C

In this exercise, the objects are similar and a number written inside a figure represents the volume of the object in cm^3.
Numbers on the outside give linear dimensions in cm. In Questions **1** to **8**, find the unknown volume V.

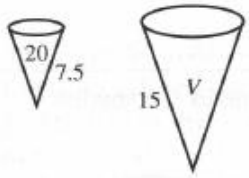
1.



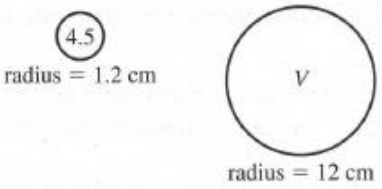
2.



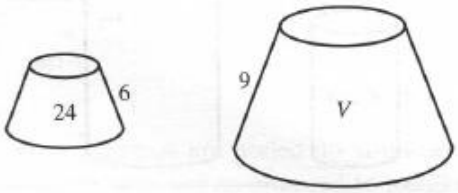
3.



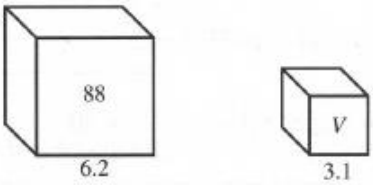
4.



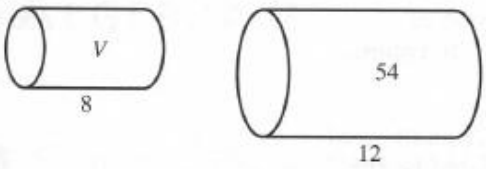
5.



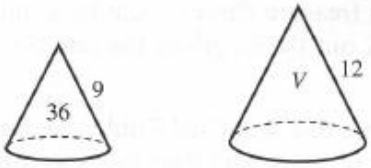
6.



7.

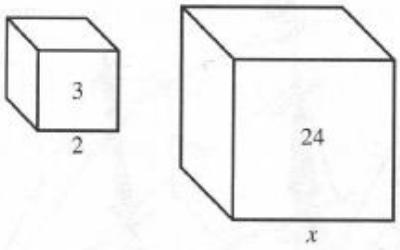


8.

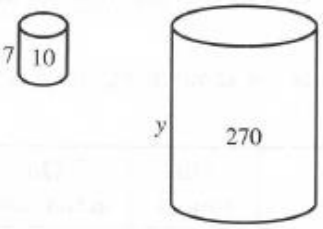


In Questions **9** to **14**, find the lengths marked by a letter.

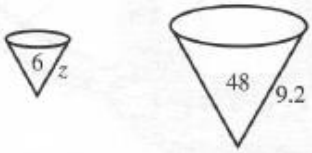
9.



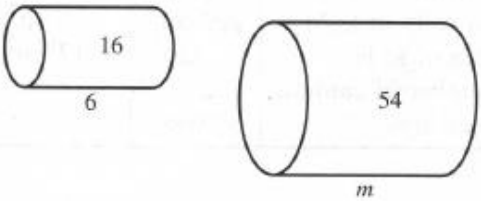
10.



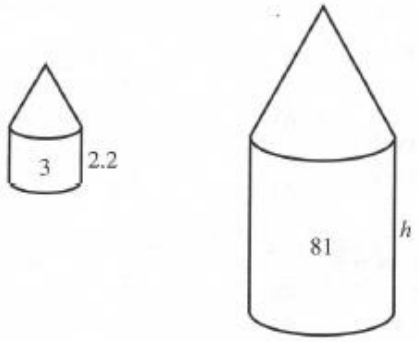
11.



12.



13.

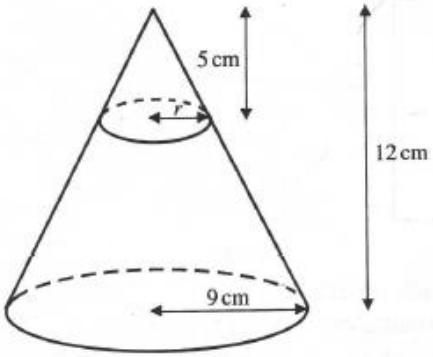


14.

Exercise D

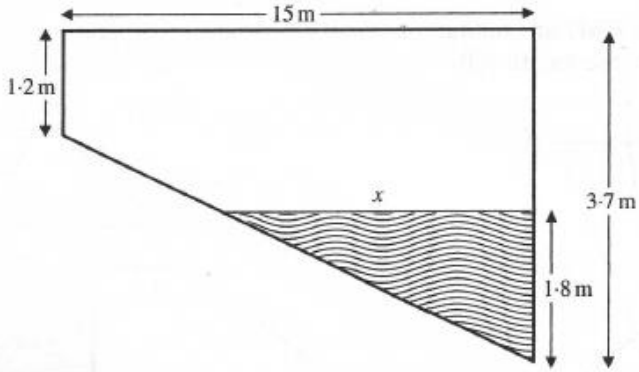
1.

A small cone is cut from a larger cone. Find the radius of the smaller cone.



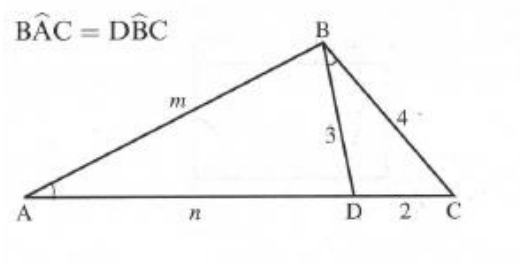
2.

The diagram shows the side view of a swimming pool being filled with water. Calculate the length x.



The diagonals of a trapezium ABCD intersect at O. AB is parallel to DC, AB = 3 cm and DC = 6 cm. Show that triangles ABO and CDO are similar. If CO = 4 cm and OB = 3 cm, find AO and DO.

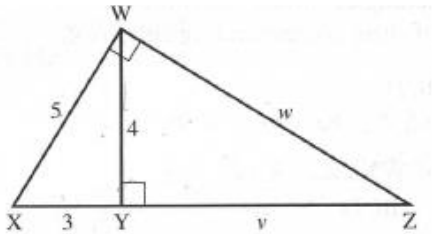
3. In the diagram on the right, it is given that angle BAC and angle DBC are equal.



   (a) Prove that triangle ABC and triangle BDC are similar triangles.

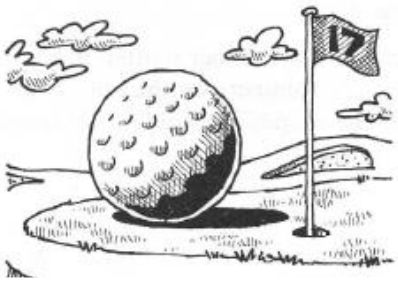
   (b) Work out the lengths *m* and *n*.

4. Identify two triangles that are mathematically similar in the diagram given below and explain why they are similar. Use your similar triangles to work out the lengths marked with letters.



5.

A giant ball is made to promote the sales of a new make of golf ball. The surface area of an ordinary ball is 50 cm^2.
The diameter of the giant ball is 100 times as great as a normal ball.
Work out the surface area of the giant ball:
(a) in cm^2
(b) in m^2.



6.

It takes 30 minutes to cut the grass in a square field of side 20 m. How long will it take to cut the grass in a square field of side 60 m?