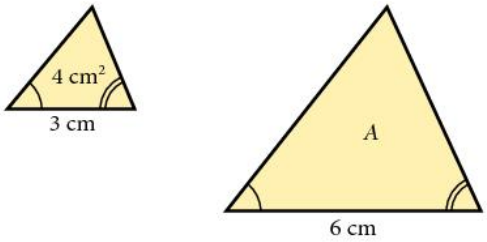
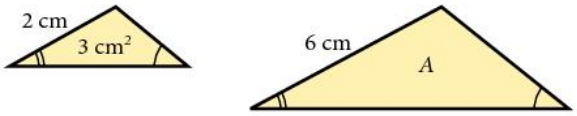
Exercise 8

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 questions **1** to **6** find the unknown area A. In each case the shapes are similar.

1.



2.



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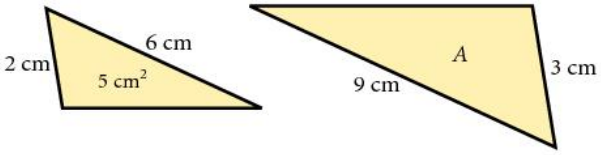

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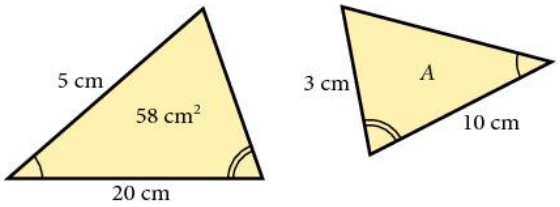

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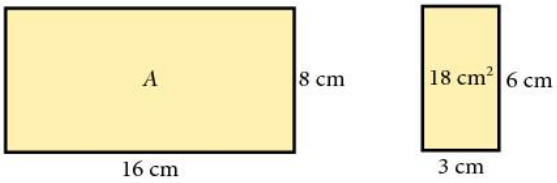
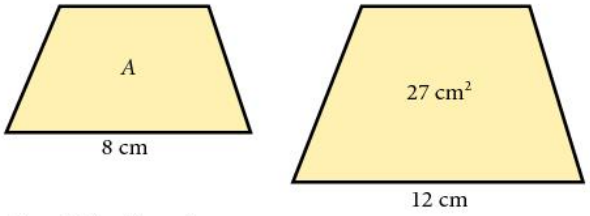
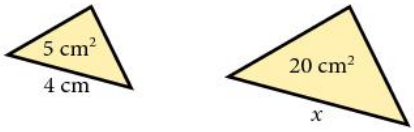


6.

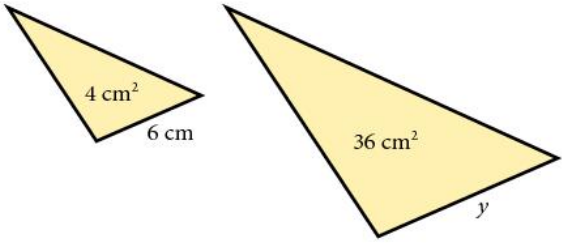


In questions **7** to **12**, find the lengths marked for each pair of similar shapes.

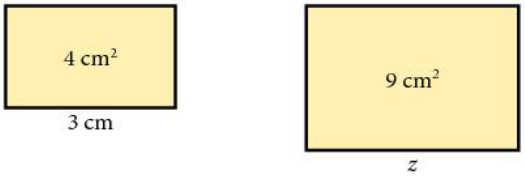
7.



8.



9.



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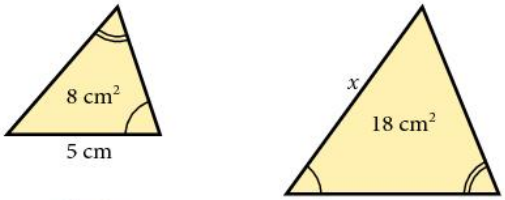
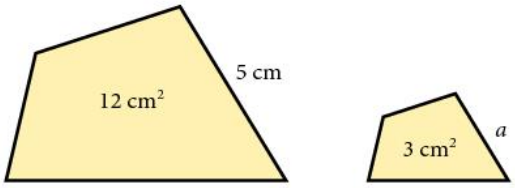
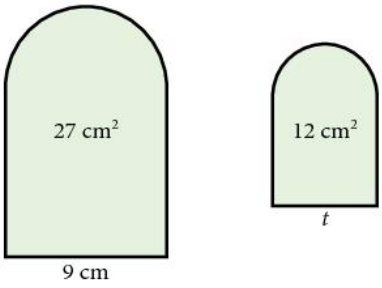


11.

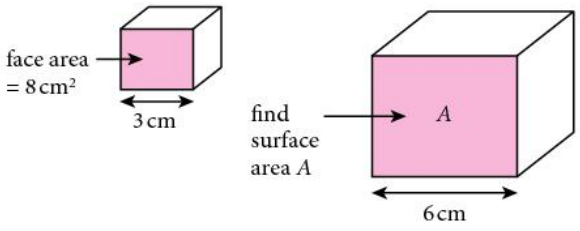


12.

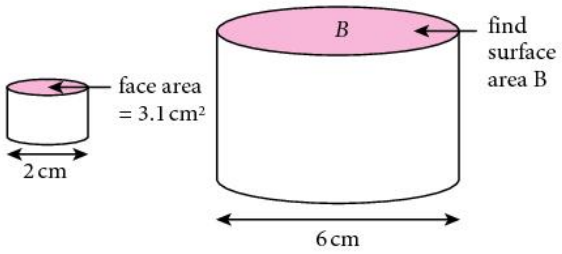


In questions **13** to **16** you have a pair of similar three-dimensional objects. Find the surface area indicated.

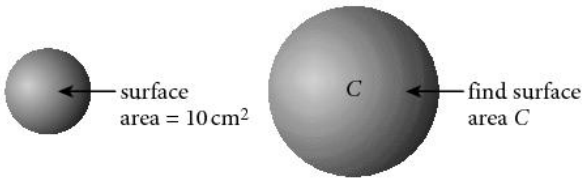
13.



14.

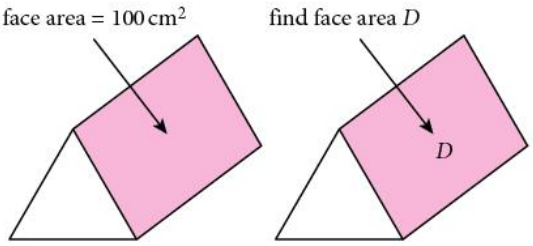


15.



The radius of the large sphere is twice the radius of the small sphere.

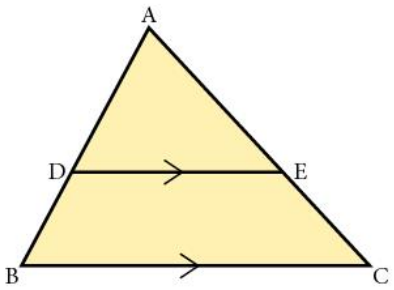
16.



The length of large solid is 1.5 times the length of the small solid.

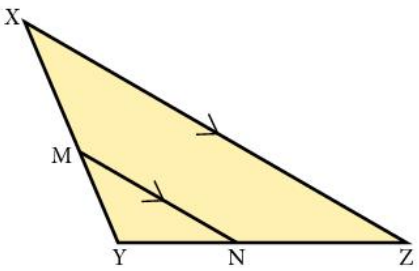
17. Given: AD = 3 cm, AB = 5 cm and area of ΔADE = 6 cm². Find:

a) area of ΔABC **b)** area of DECB

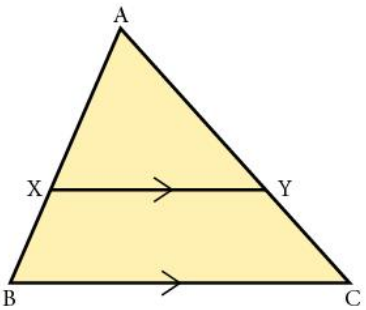


18. Given: XY = 5 cm, MY = 2 cm and area of ΔMYN = 4 cm². Find:

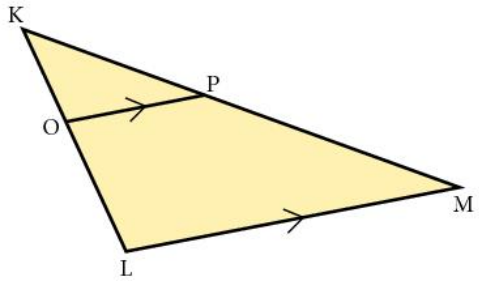
a) area of ΔXYZ **b)** area of MNZX



19. Given XY = 2 cm, BC = 3 cm and area of XYCB = 10 cm², find the area of ΔAXY.

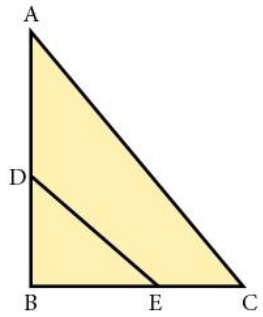


20. Given KP = 3 cm, area of ΔKOP = 2 cm² and area of OPML = 16 cm², find the length of PM.



21. The triangles ABC and EBD are similar (AC and DE are *not* parallel).

If AB = 8 cm, BE = 4 cm and the area of ΔDBE = 6 cm², find the area of ΔABC.



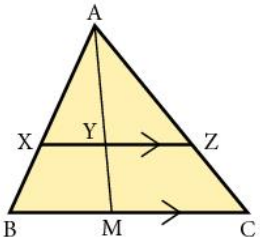
22. Given: AZ = 3 cm, ZC = 2 cm, MC = 5 cm, BM = 3 cm. Find:

a) XY

b) YZ

c) the ratio of areas AXY : AYZ

d) the ratio of areas AXY : ABM



23. A floor is covered by 600 tiles which are 10 cm by 10 cm. How many 20 cm by 20 cm tiles are needed to cover the same floor?

24. A wall is covered by 160 tiles which are 15 cm by 15 cm. How many 10 cm by 10 cm tiles are needed to cover the same wall?

25. When potatoes are peeled do you lose more peel when you use big potatoes or small potatoes?

Volumes of similar objects

When solid objects are similar, one is an accurate enlargement of the other.

If two objects are similar and the ratio of corresponding sides is k, then the ratio of their volumes is k^3.

A line has one dimension, and the scale factor is used once.

An area has two dimensions, and the scale factor is used twice.

A volume has three dimensions, and the scale factor is used three times.