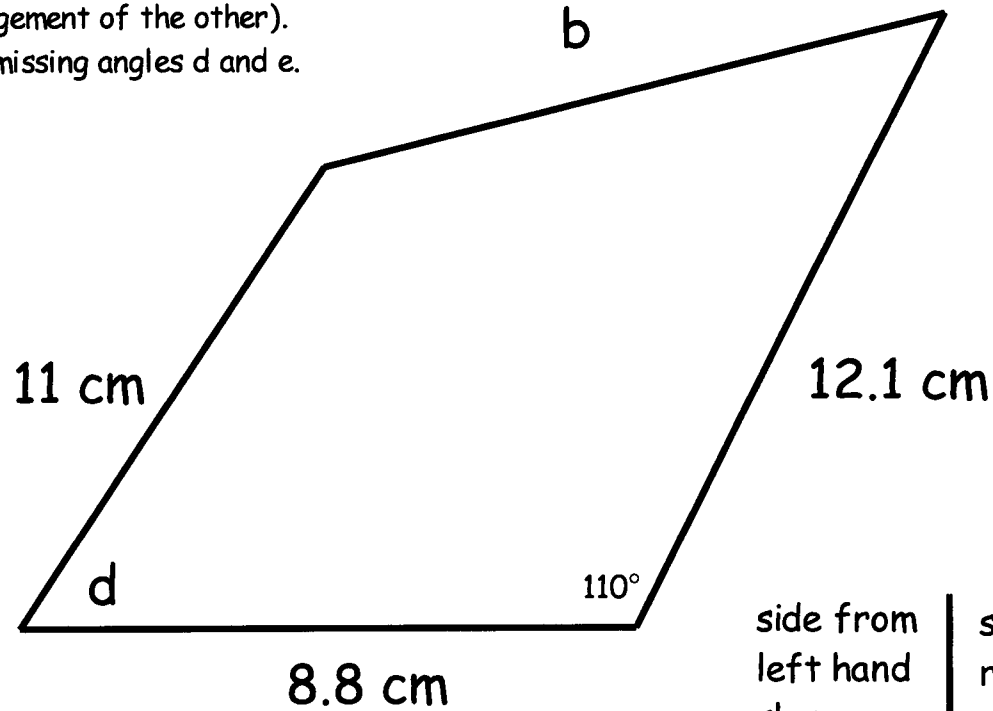
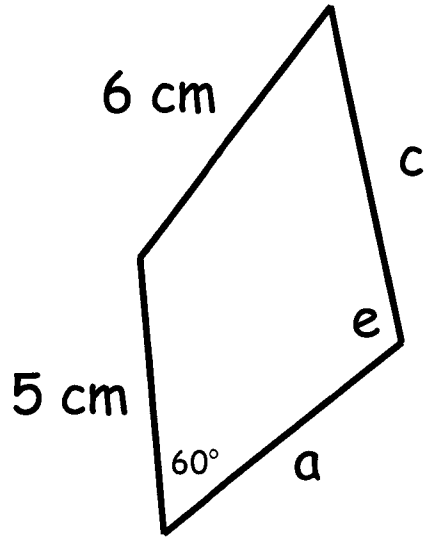


SIMILAR SHAPES and CONGRUENCE

Page	Description
1	Introduction to similar shapes
2	Similar shapes, finding scale factors and missing lengths
3	Similar shapes, finding scale factors and missing lengths
4	Length, area and volume scale factors
5	Length, area and volume scale factors with similar cuboids
6	Questions using length and scale factors
7	Questions using length, area and volume scale factors
8	Questions using length, area and volume scale factors
9	Mixed examples on similar shapes
10	Identify congruent shapes
11	Conditions for congruence in triangles
12	Questions about congruent triangles

Similar Shapes

These two shapes are similar (one is an enlargement of the other).
Find the missing lengths a, b and c. Find the missing angles d and e.



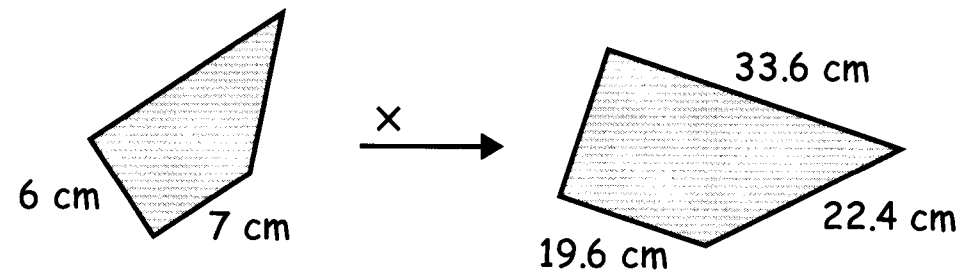
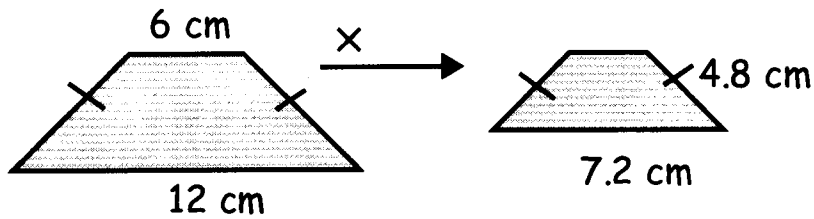
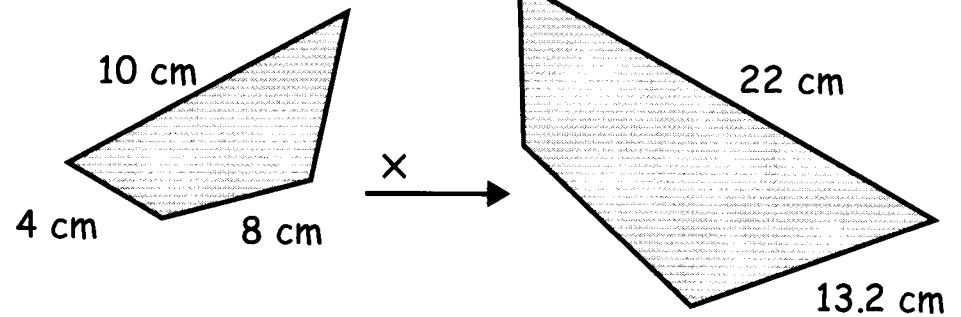
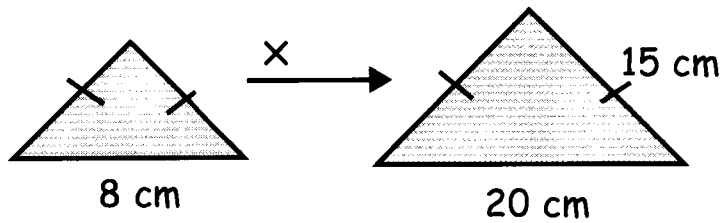
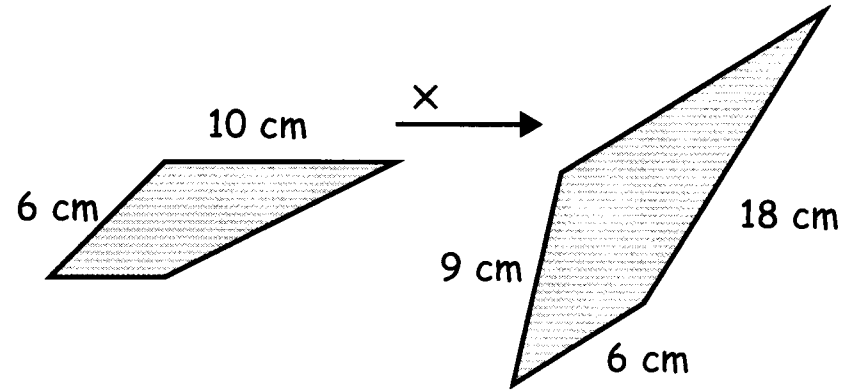
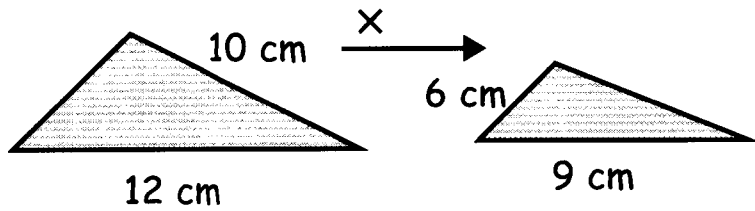
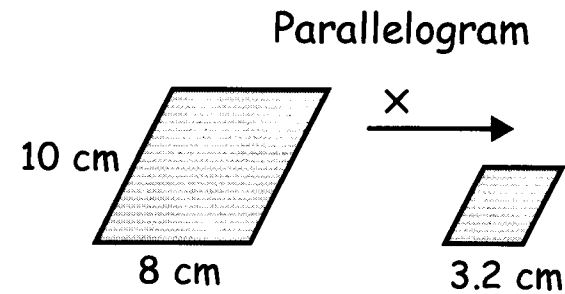
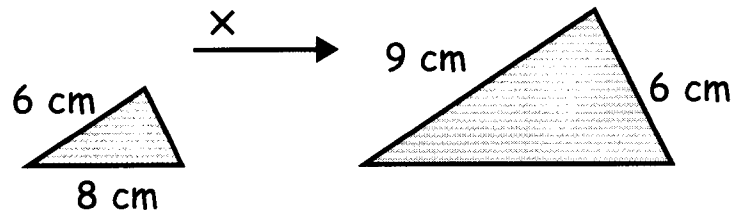
side from left hand shape	side from right hand shape
a	
5	
6	
c	

- First - identify corresponding sides and angles.
- Second - Find the scale factor.
- Third - Calculate the missing values.

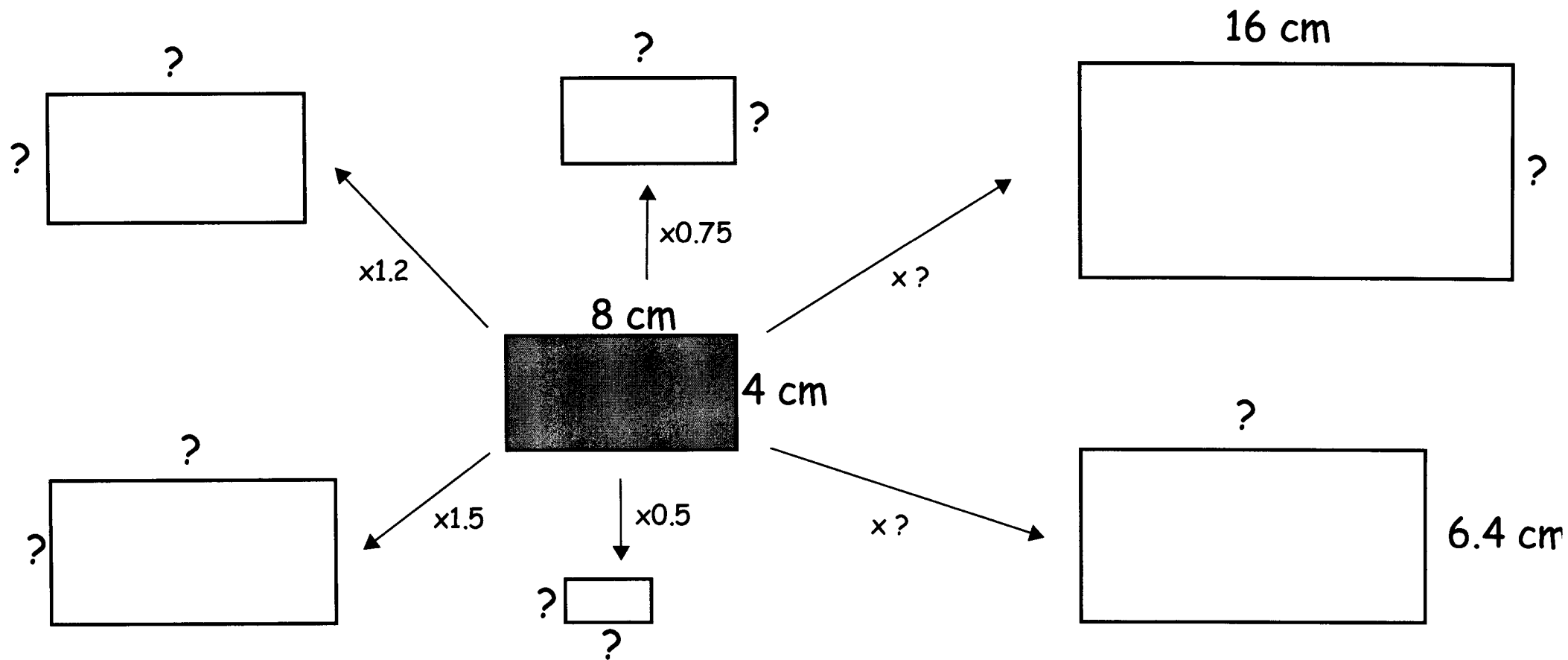
Similar Shapes

Find the scale factors LEFT to RIGHT. Write them on the arrows.

Find all the missing lengths. Write them on the shapes.



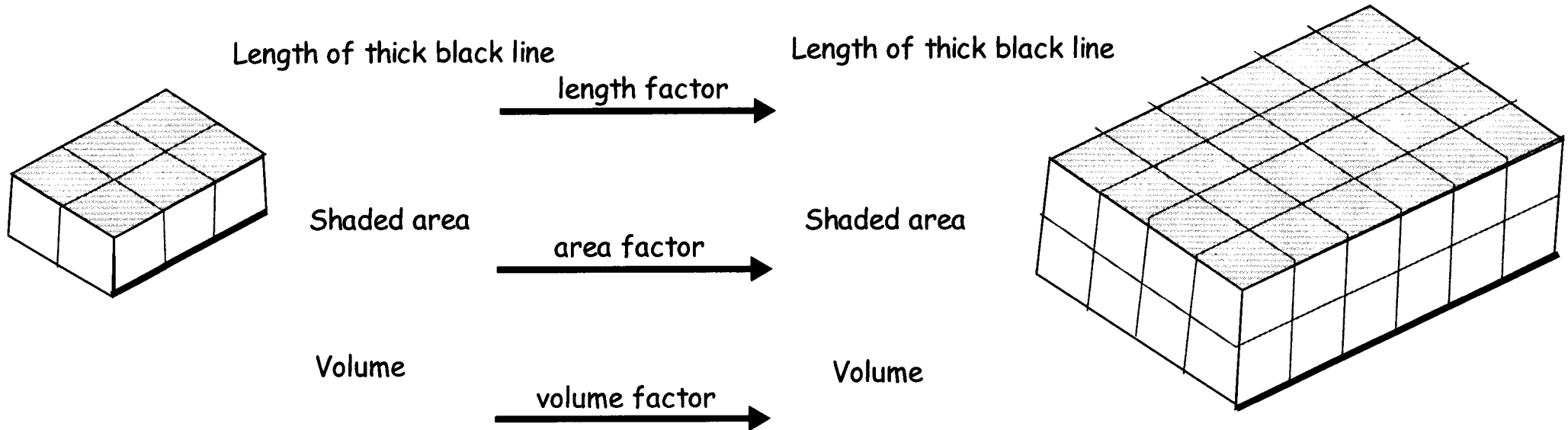
These rectangles are all SIMILAR to the shaded rectangle. Find the missing lengths and multipliers



③

Scale Factors in similar figures

These cuboids are similar. Fill in the missing lengths, areas, volumes and scale factors.



Remember Area scale factor = (length scale factor)²

Volume scale factor = (length scale factor)³

Length scale factor = $\sqrt{(\text{area scale factor})}$

Length scale factor = $\sqrt[3]{(\text{volume scale factor})}$

Remember this also applies to units

1 m = 100 cm

1 m² = 10000 cm²

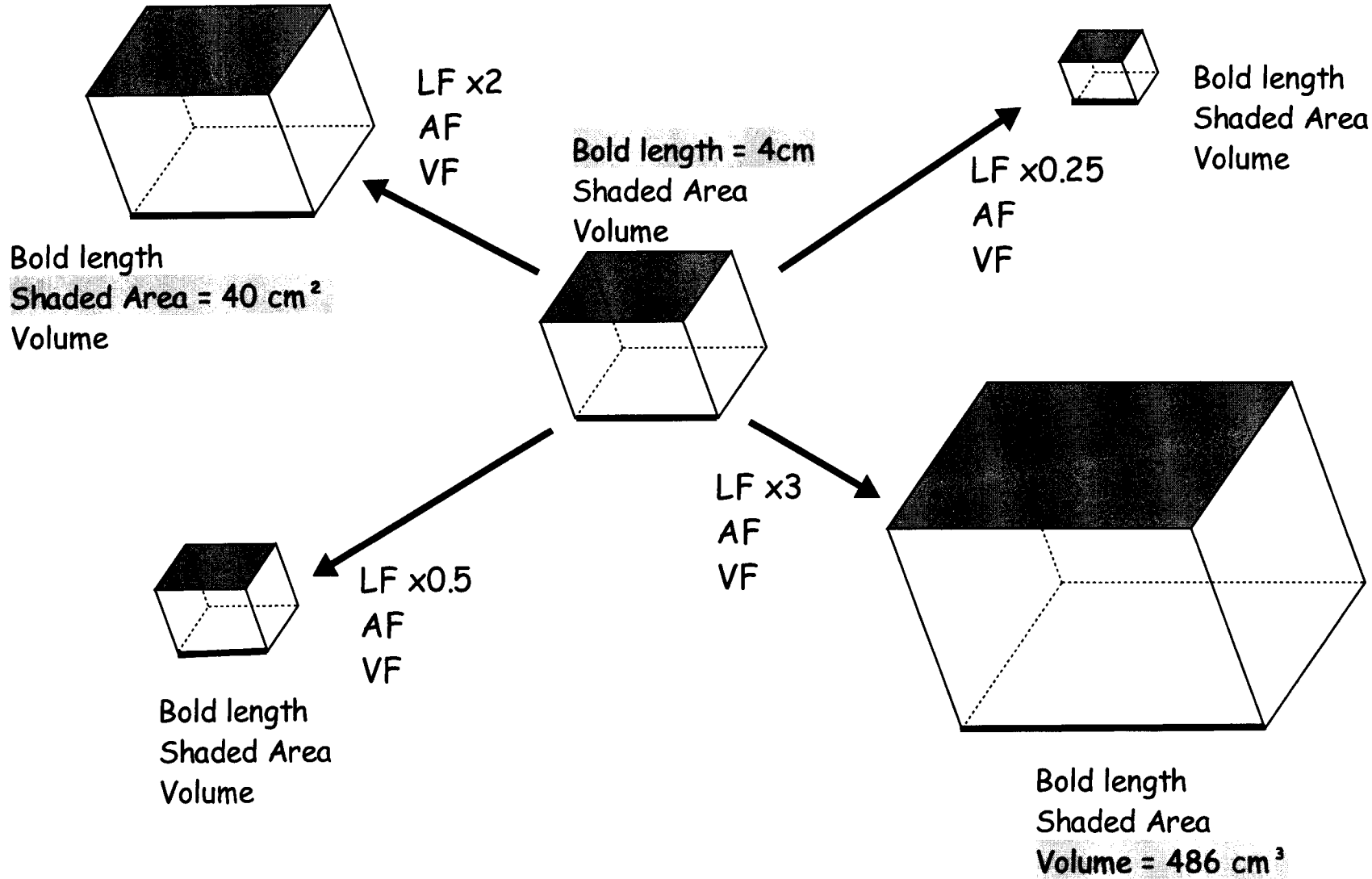
1 m³ = 1000000 cm³

1 cm = 10 mm

1 cm² = mm²

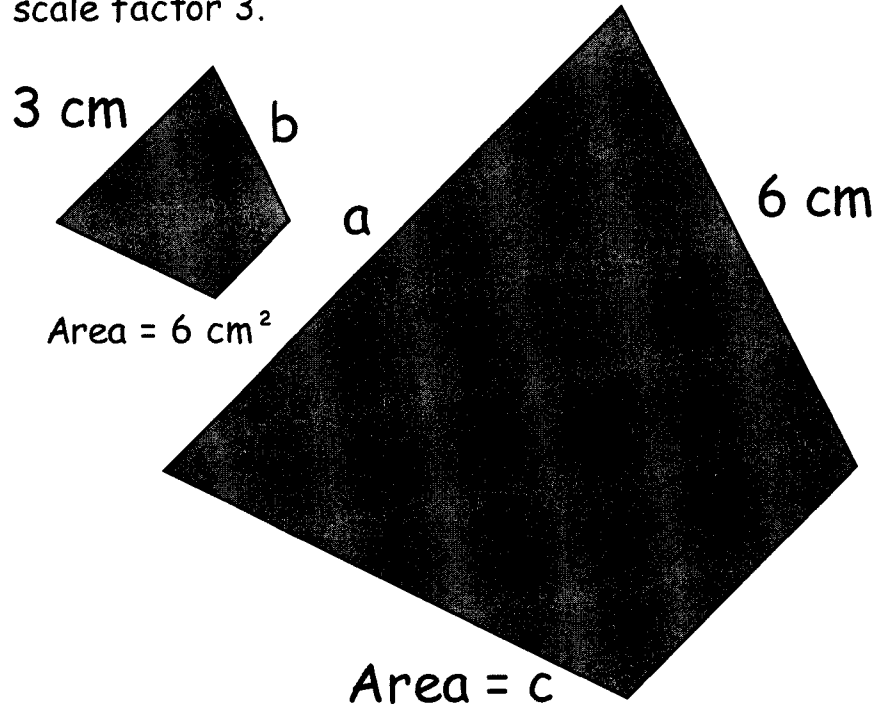
1 cm³ = mm³

These cuboids are all similar. The length scale factors are shown on the diagram. Find the missing values and for each cuboid find its dimensions.



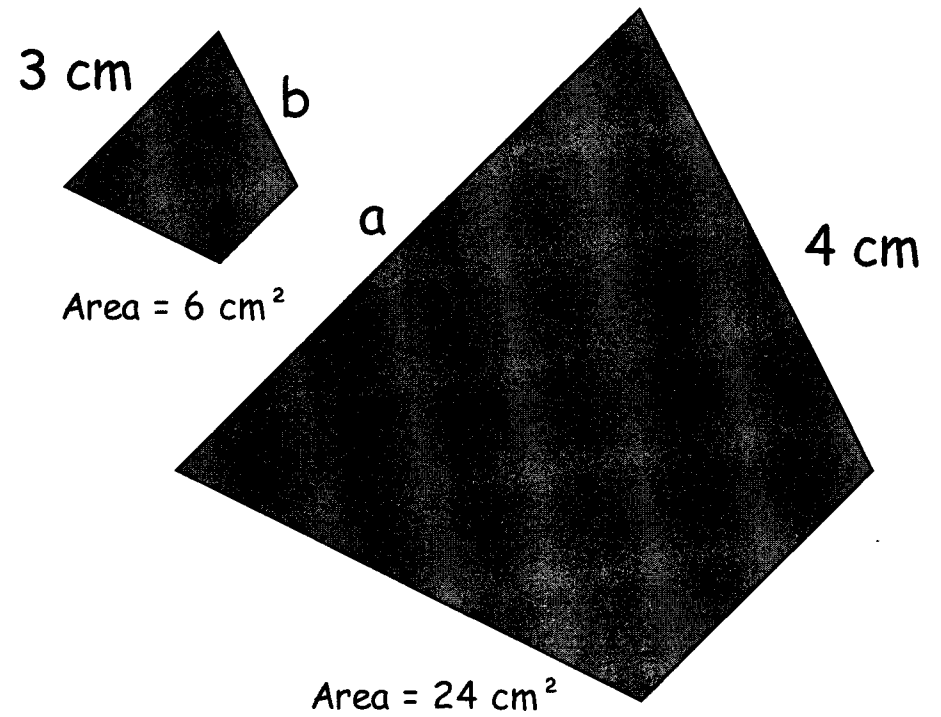
(5)

1) These drawings represent an enlargement of scale factor 3.



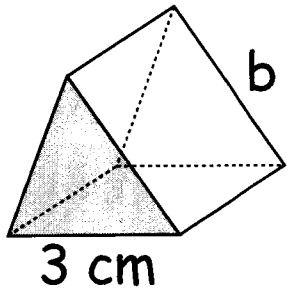
Length scale factor =
 Area scale factor =
 length a =
 length b =
 area c =

2) These drawings represent an enlargement of scale factor ? (small to large)

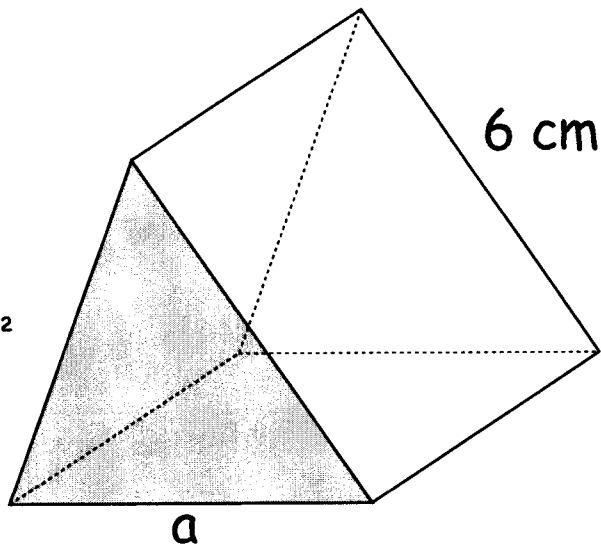


Length scale factor =
 Area scale factor =
 length a =
 length b =

3) These drawings represent an enlargement of scale factor 2.



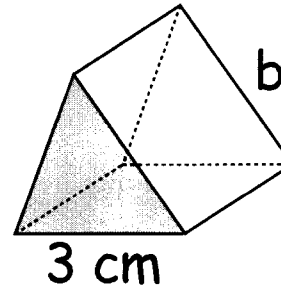
shaded area = 5 cm^2
 volume = 10 cm^3



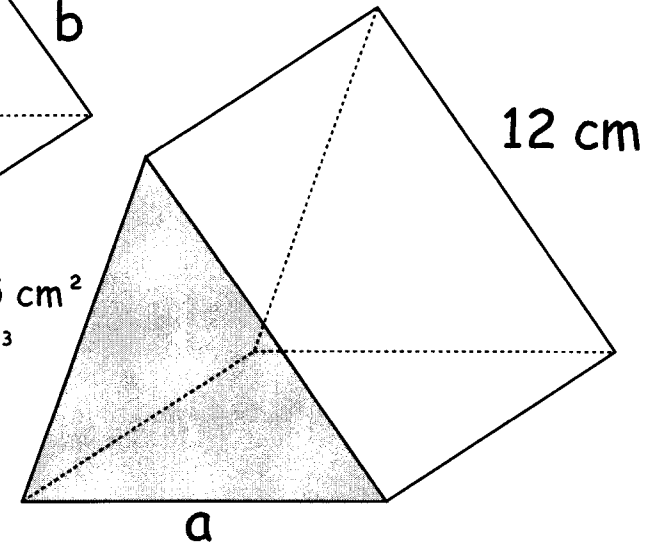
shaded area = c
 volume = d

Length scale factor =
 Area scale factor =
 Volume scale factor =
 length a =
 length b =
 area c =
 volume d =

4) These drawings represent an enlargement of scale factor ?



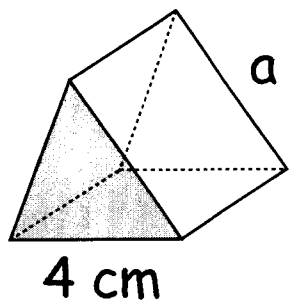
shaded area = 5 cm^2
 volume = 10 cm^3



shaded area = 45 cm^2
 volume = c

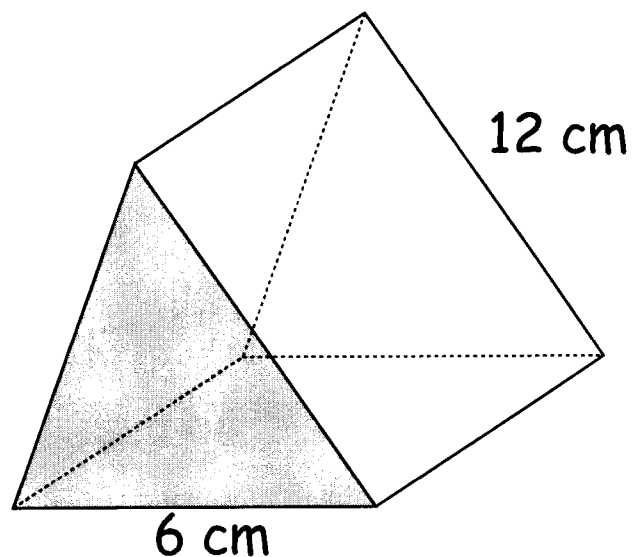
Length scale factor =
 Area scale factor =
 Volume scale factor =
 length a =
 length b =
 volume c =

1) These two shapes are SIMILAR.



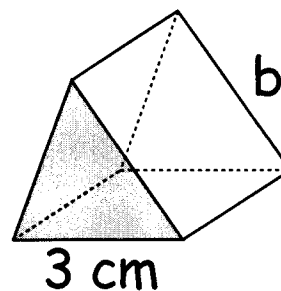
shaded area = 8 cm^2
 volume = 10 cm^3

Length factor =
 Area factor =
 Volume factor =
 length a =
 area b =
 volume c =



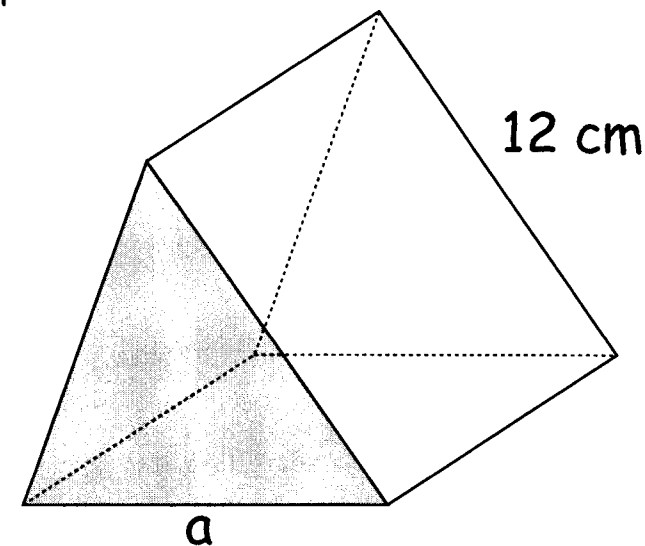
shaded area = $b \text{ cm}^2$
 volume = $c \text{ cm}^3$

2) These two shapes are SIMILAR.



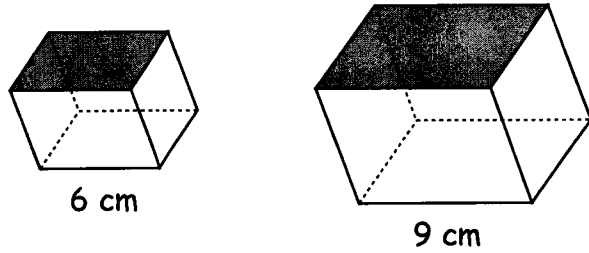
shaded area = c
 volume = 10 cm^3

Length factor =
 Area factor =
 Volume factor =
 length a =
 length b =
 area c =



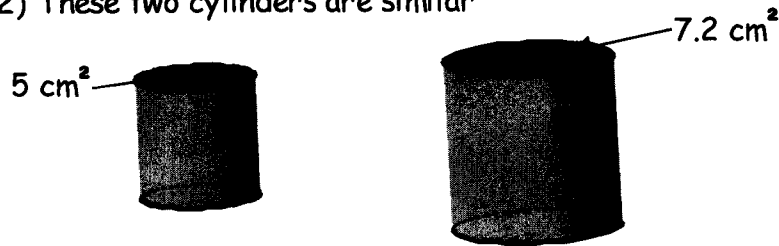
shaded area = 20 cm^2
 volume = 80 cm^3

1) These two cuboids are similar



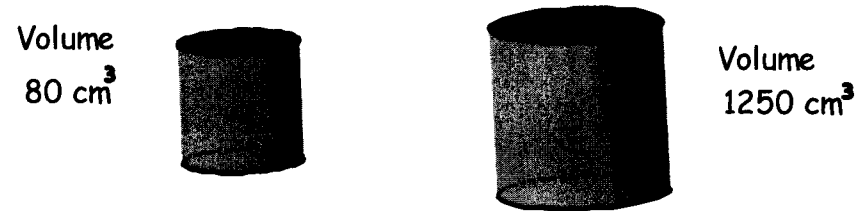
- Find the length, area and volume scale factors
- The shaded area of the smaller cuboid is 15 cm^2 . Find the corresponding shaded area in the larger cuboid.
- The volume of the larger cuboid is 202.5 cm^3 . Find the volume of the smaller cuboid.

2) These two cylinders are similar



- Find the length, area and volume scale factors
- The radius of the larger cylinder is 1.56 cm . Find the radius of the smaller cylinder.
- The volume of the larger cylinder is 86.4 cm^3 . Find the volume of the smaller cylinder.

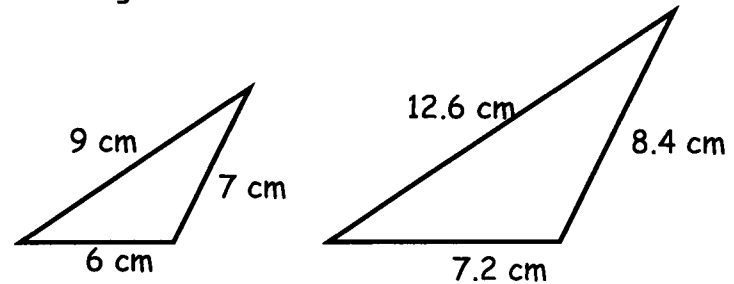
3) These two cylinders are similar



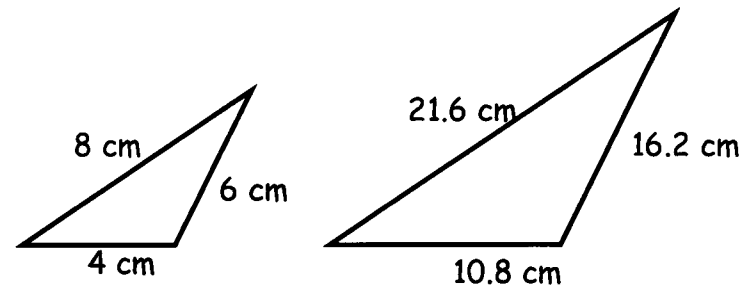
- Find the length, area and volume scale factors
- The radius of the smaller cylinder is 4 cm . Find the radius of the larger cylinder.
- The shaded area of the larger cylinder is 312.5 cm^2 . Find the corresponding shaded area in the smaller cylinder.

Are these triangles similar?

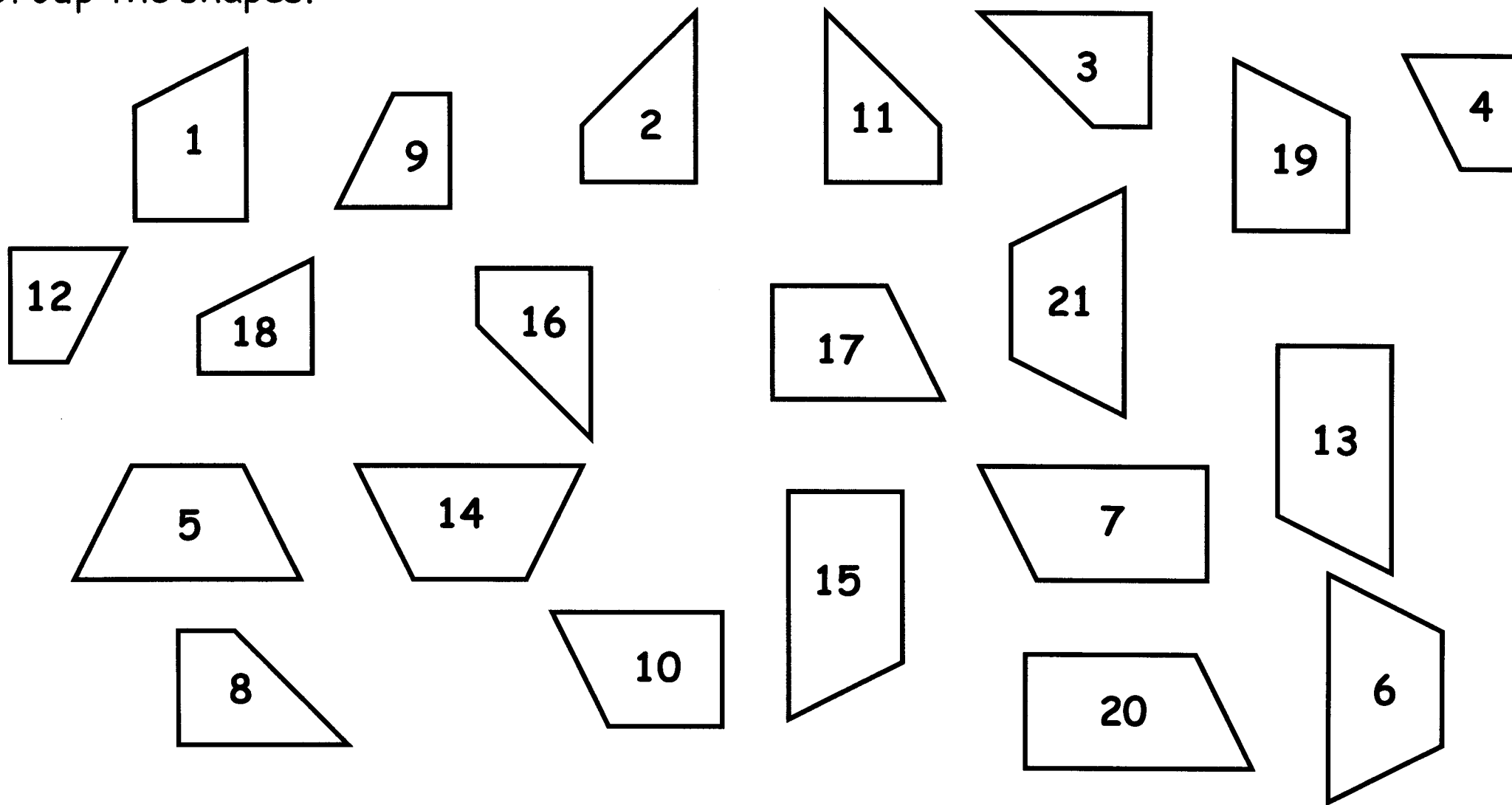
4)



5)



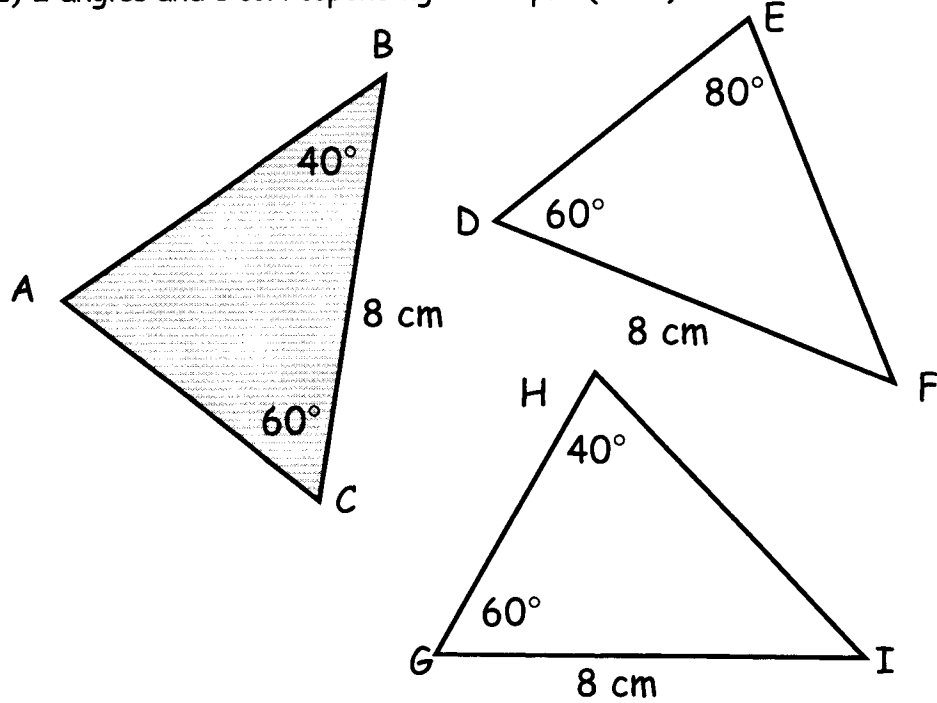
Congruent Shapes are IDENTICAL. They may be rotated or reflected.
Group the shapes.



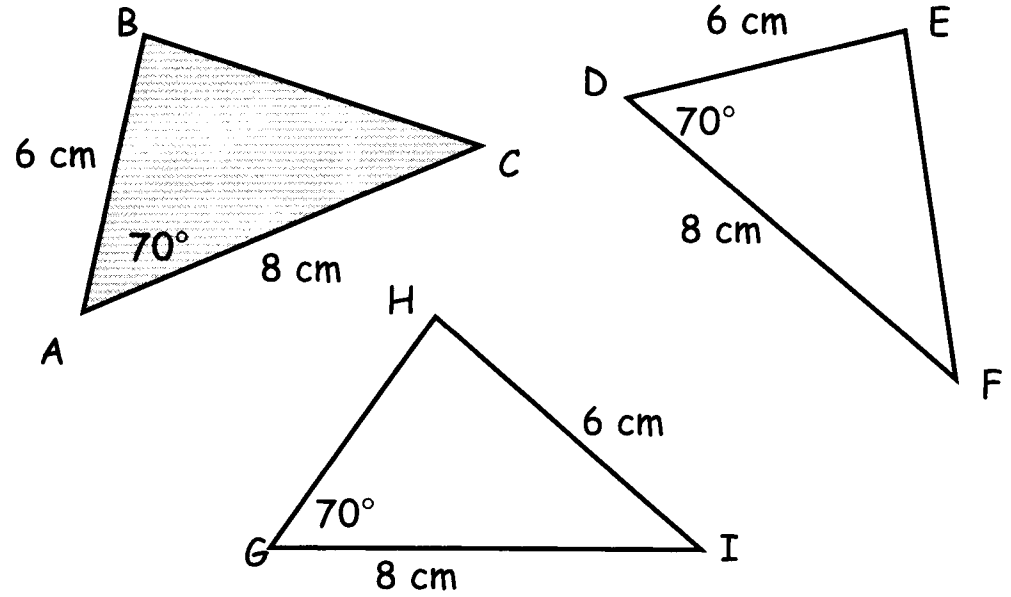
Conditions/Reasons for CONGRUENCE in Triangles

In each question state which triangle is congruent to the shaded one?

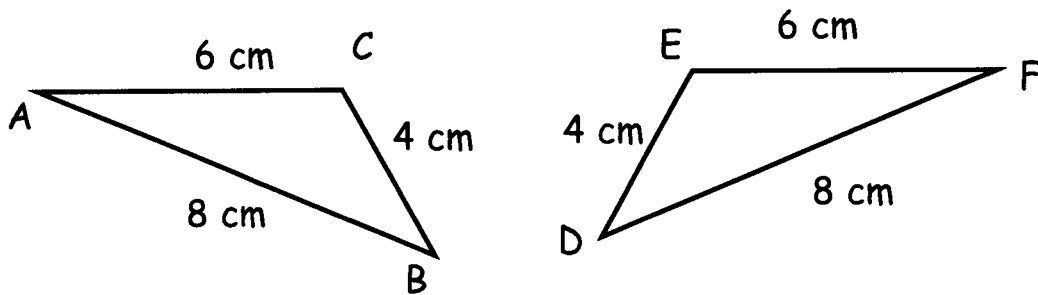
1) 2 angles and 1 corresponding side equal (ASA)



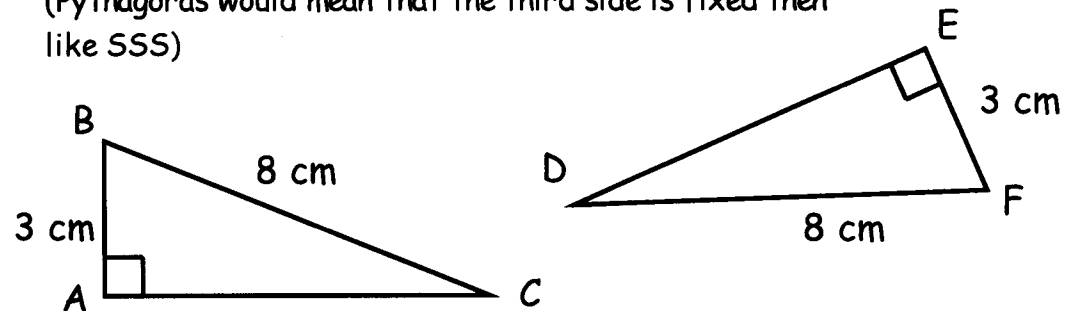
2) 2 corresponding sides and the angle between the sides equal (SAS)



3) 3 corresponding sides equal (SSS)



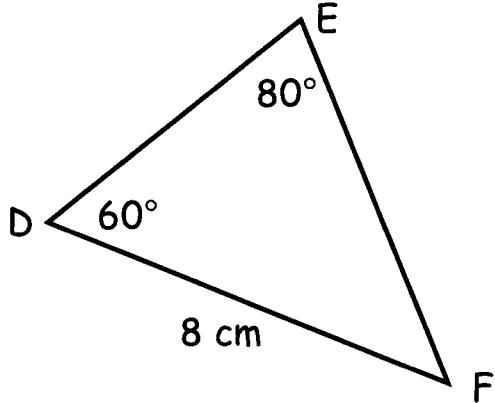
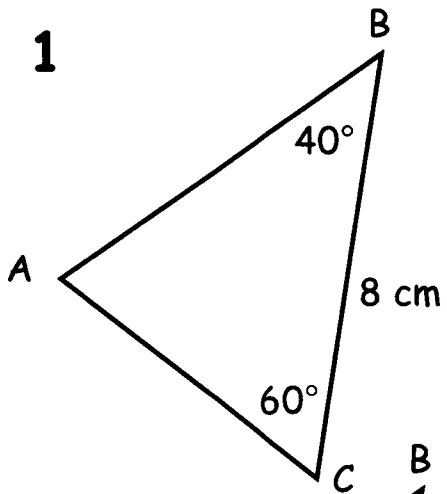
4) A right angle, the hypotenuse and another side equal. (RHS)
(Pythagoras would mean that the third side is fixed then like SSS)



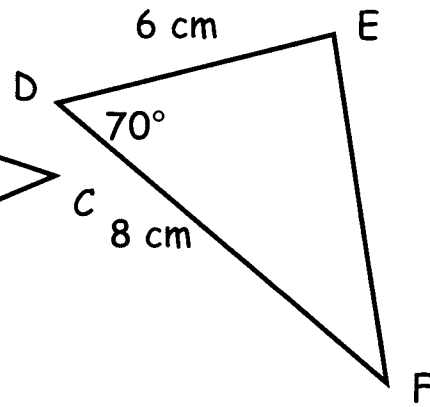
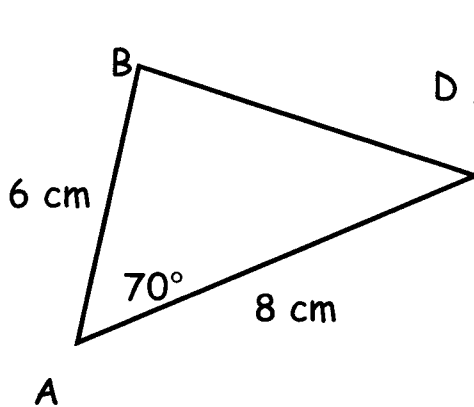
Are the pairs of triangles congruent? Give a reason if they are. SSS, SAS, ASA, RHS

Label every ANGLE and SIDE that you can.

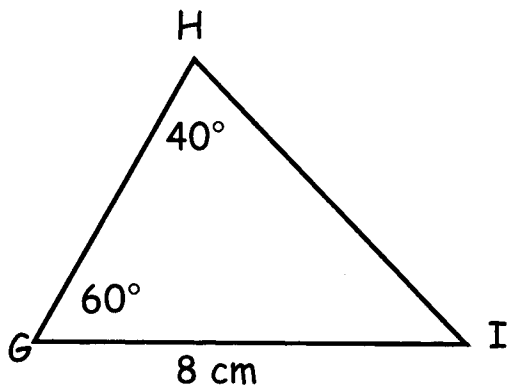
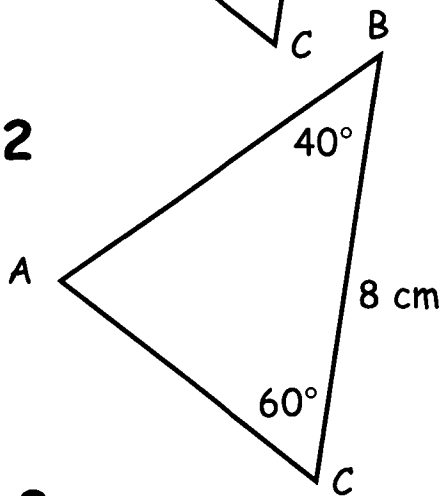
1



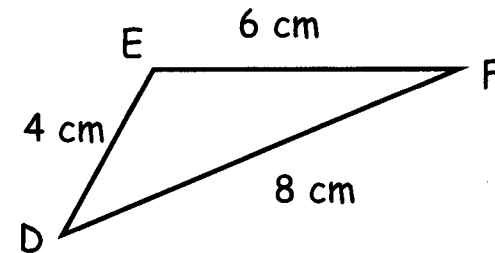
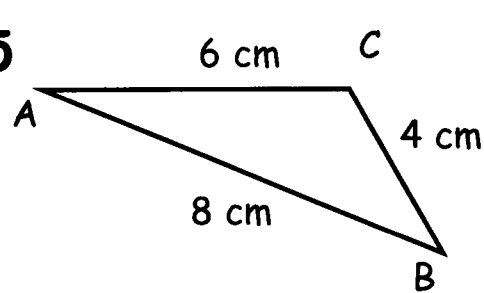
4



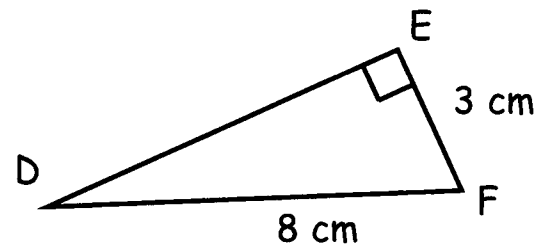
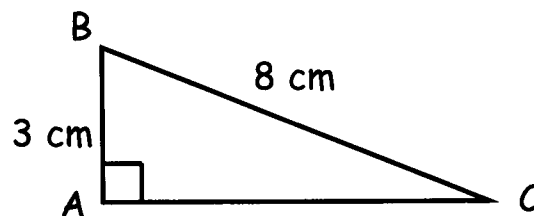
2



5



6



3

