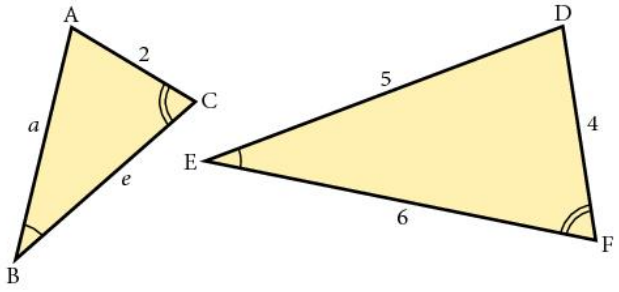
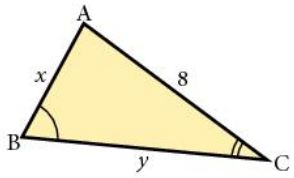
Exercise 7

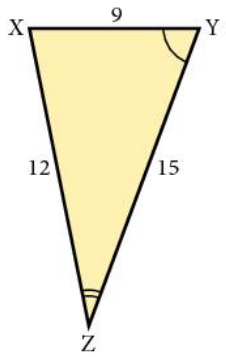
Find the sides marked with letters in questions **1** to **11**; all lengths are given in centimetres.

1.

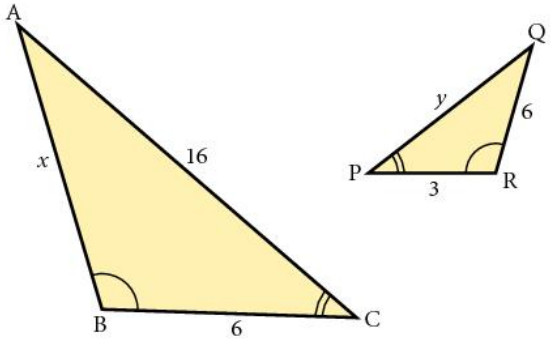


2.

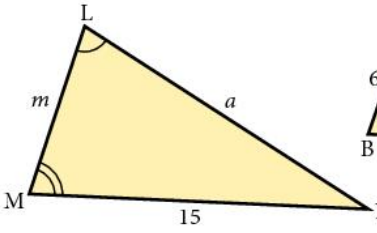


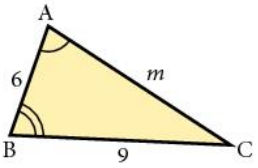


3.

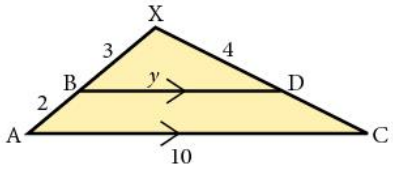


4.

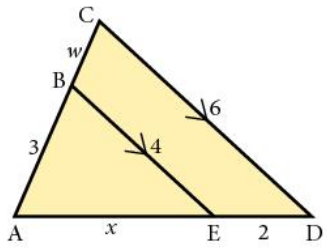




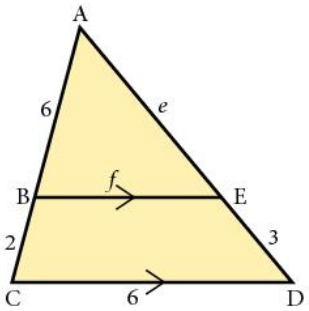
5.



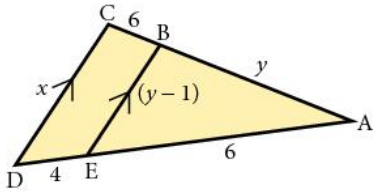
6.



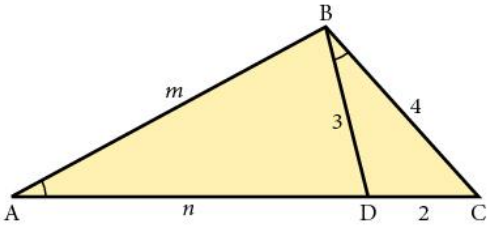
7.



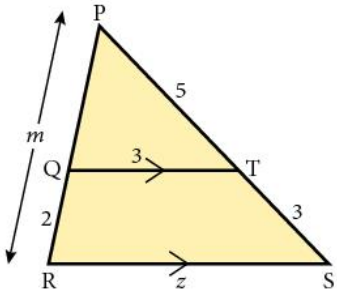
8.



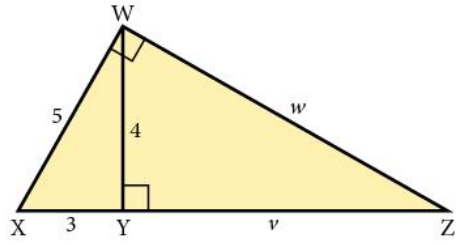
9. $B\hat{A}C = D\hat{B}C$



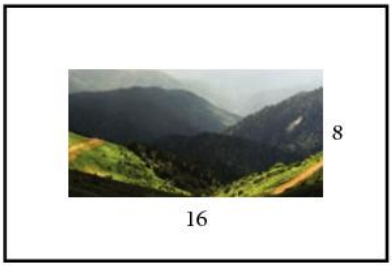
10.



11.



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



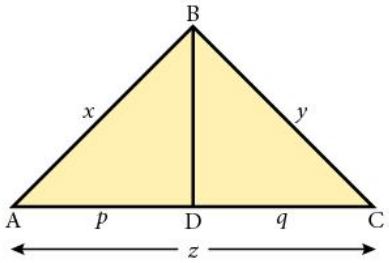
13. The diagonals of a trapezium ABCD intersect at O. AB is parallel to DC, AB = 3 cm and DC = 6 cm. If CO = 4 cm and OB = 3 cm, find AO and DO.

14. A tree of height 4 m casts a shadow of length 6.5 m. Find the height of a house casting a shadow 26 m long.

15. Which of the following *must* be similar to each other?

a) two equilateral triangles
b) two rectangles
c) two isosceles triangles
d) two squares
e) two regular pentagons
f) two kites
g) two rhombuses
h) two circles

16. In the diagram $A\hat{B}C = A\hat{D}B = 90°$, AD = p and DC = q.



a) Use similar triangles to show that $x^2 = pz$.

b) Find a similar expression for y^2.

c) Add the expressions for x^2 and y^2 and hence prove Pythagoras' theorem.

17. In a triangle ABC, a line is drawn parallel to BC to meet AB at D and AC at E. DC and BE meet at X. Prove that:

a) the triangles ADE and ABC are similar

b) the triangles DXE and BXC are similar

c) $\frac{AD}{AB} = \frac{EX}{XB}$

18. From the rectangle ABCD a square is cut off to leave rectangle BCEF.

Rectangle BCEF is similar to ABCD. Find x and hence state the ratio of the sides of rectangle ABCD.

ABCD is called the Golden Rectangle and is an important shape in architecture.