1 **(a)** Maciek draws a quadrilateral on a piece of paper.
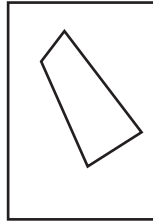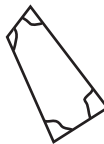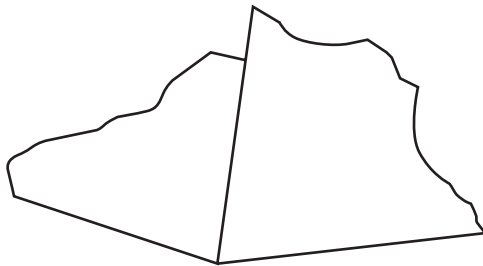

He cuts it out using scissors then tears off the four angles.

He joins the 4 **angles** together at a point with no overlapping.

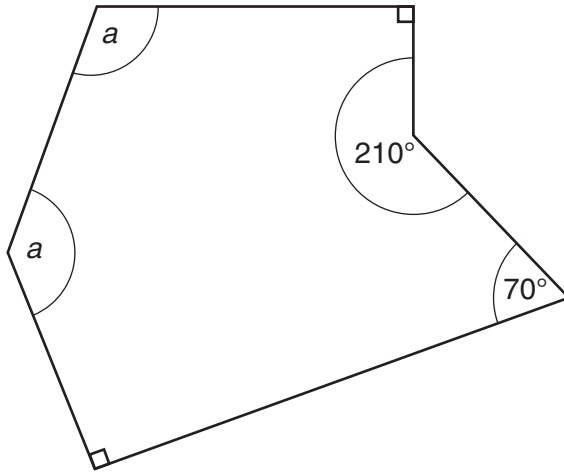This is a sketch of the first two angles.

Not to scale

(i) Complete the sketch above.   **[1]**

(ii) What angle fact does your sketch demonstrate about the angles in a quadrilateral?

....

.... **[1]**

(b) Calculate the size of the two equal angles, each labelled a, in this irregular hexagon.

Not to scale

(b) ....° **[4]**
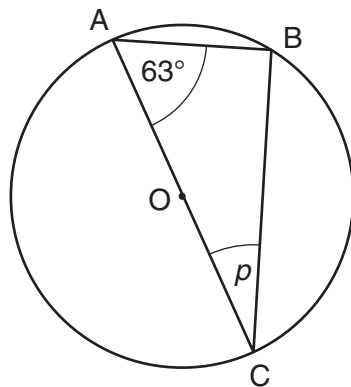
2   A, B and C are points on the circumference of a circle, centre O.
Angle BAC = 63°.
AOC is a diameter of the circle.

Find the size of angle *p*.
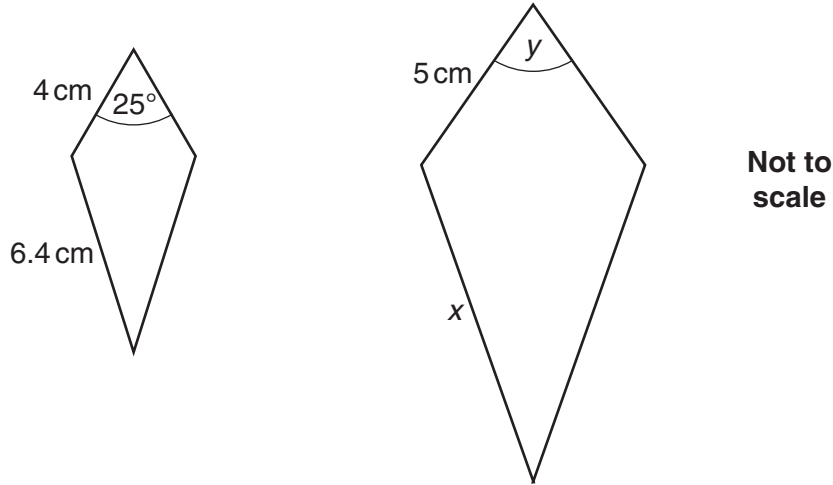Give geometrical reasons for your answer.

Not to scale

p = ...° because ....

....

....

.... **[3]**

3 These two kites are mathematically similar.

4 cm 25°

6.4 cm

5 cm y

x

Not to scale

(a) Calculate length *x*.

(a) ....cm **[3]**

(b) What is the size of angle *y*?

(b) ....° **[1]**

4 The diagram shows a triangle with one of its sides extended.
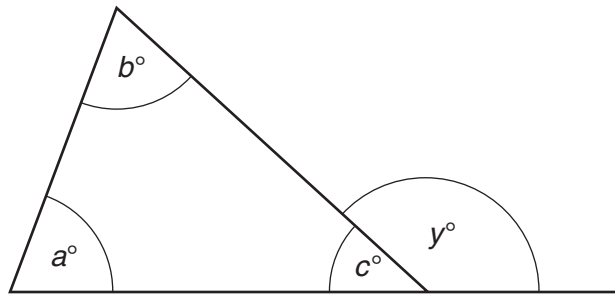
Complete these statements to show that $y = a + b$.

$a + b + c = $ _____ because _____

_____

Therefore $a + b = 180 - c$.

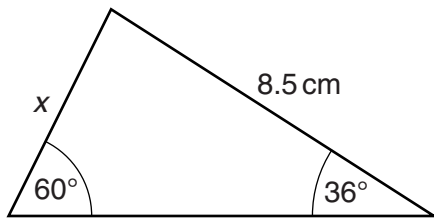Also $\quad y = 180 - c \quad$ because _____

_____

Therefore $y = a + b$.

This proves that the exterior angle of a triangle is equal to the sum of the

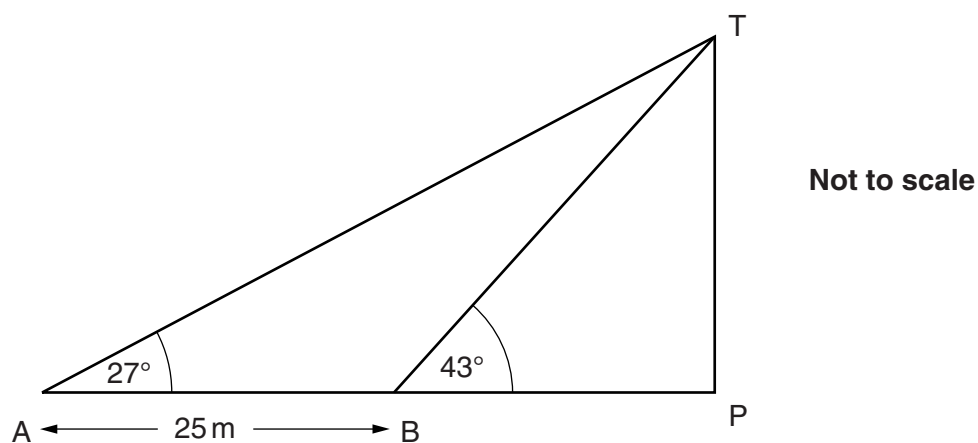two _____ opposite angles. **[4]**

5   Here is a triangle.

Not to scale

Calculate length *x*.

_____ cm **[3]**

6 TP is a tower on horizontal ground, ABP.
Two straight cables, AT and BT, connect the top, T, of the tower to the ground.
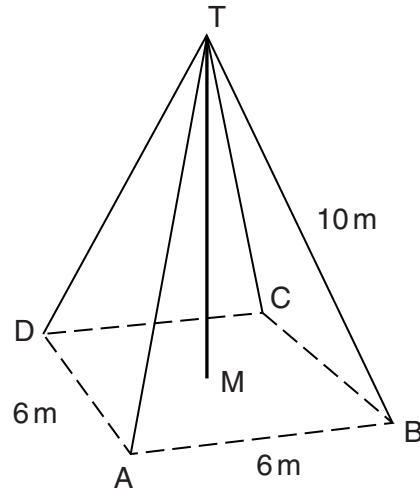

Not to scale

AT and BT make angles with the ground of 27° and 43° respectively.
B is 25 m closer to the foot of the tower, P, than A.

Work out the length of the cable AT.

_____ m **[4]**

7 A vertical transmitter mast, TM, stands on horizontal ground.
Straight wires, each of length 10 m, are fixed to the top of the mast, T, and to points A, B, C and D on the ground.
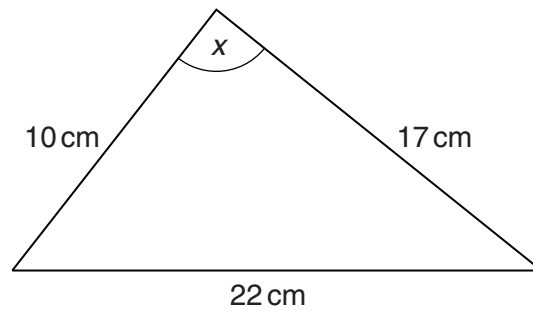A, B, C and D are the corners of a square of side 6 m.

(a) Show that the height of the mast, TM, is 9.1 m correct to one decimal place.

_____

_____

_____

_____ **[3]**

(b) Calculate the angle that the wires make with the ground.

(b) _____ ° **[3]**

8   Elaine has this triangular piece of material.
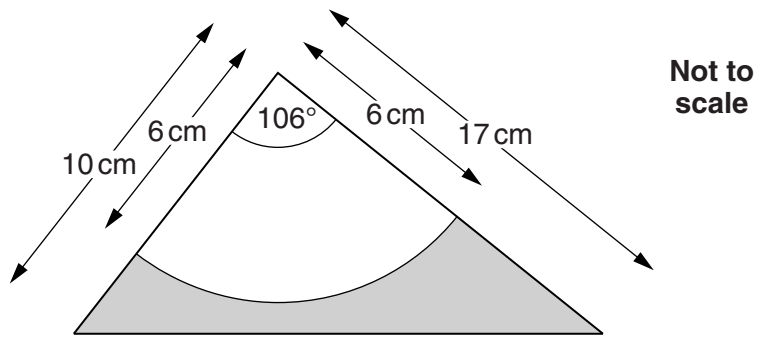

(a)   Show that $x = 106°$ correct to the nearest degree.   **[3]**

(b) From the material, Elaine cuts out a sector of a circle, radius 6 cm.

Find the area of the material left over, shown shaded.

(b) .... cm^2 **[6]**