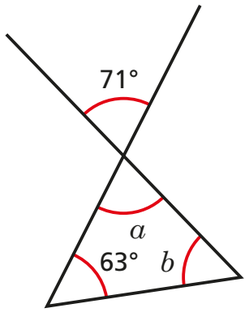
Solve complex angle problems

1 Work out the sizes of the unknown angles.

Give reasons for each stage of your working.

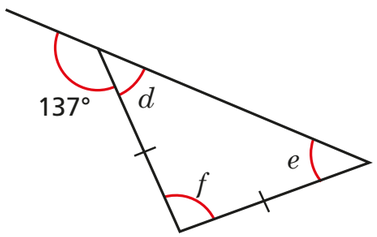
a)



a = 71° because vertically opposite angles are equal.

b = 46° because angles in a triangle sum to 180°

b)

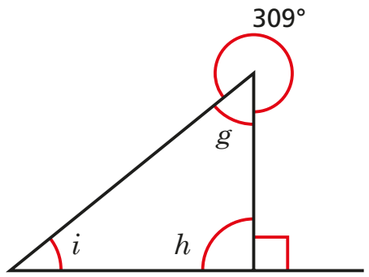


d = 43° because angles on a straight line sum to 180°

e = 43° because base angles in an isosceles triangle are equal.

f = 94° because angles in a triangle sum to 180°

c)



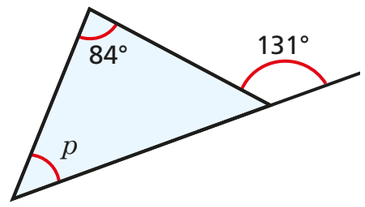
g = 51° because angles around a point sum to 360°

h = 90° because angles on a straight line sum to 180°

i = 39° because angles in a triangle sum to 180°

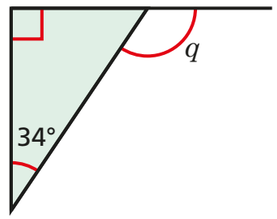
2 Work out the sizes of the unknown angles.

a)



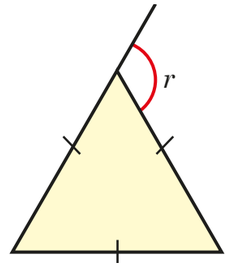
p = 47°

b)



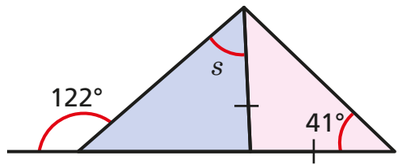
q = 124°

c)



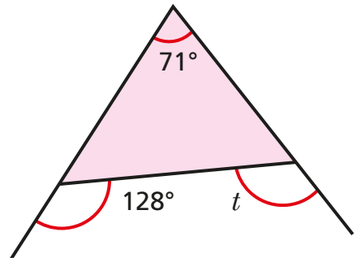
r = 120°

d)



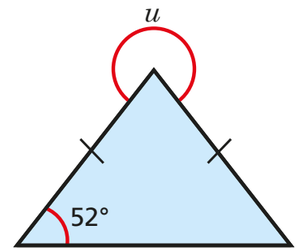
s = 40°

e)



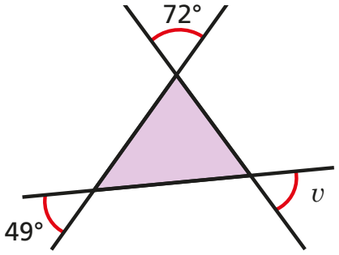
t = 123°

f)



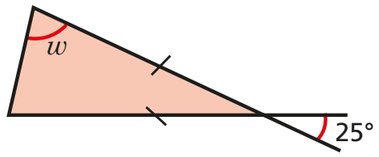
u = 284°

g)



v = 59°

h)

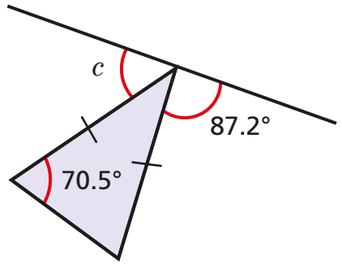


w = 77.5°

Talk about your reasons with a partner.

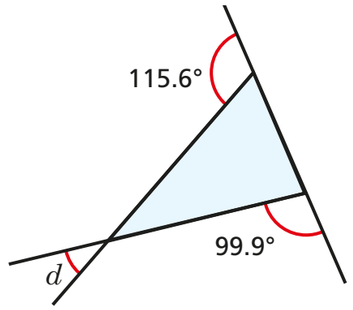
3 Work out the sizes of the unknown angles.

a)



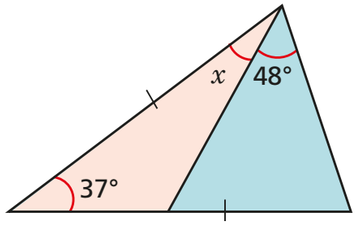
c = 53·8°

b)



d = 35·5°

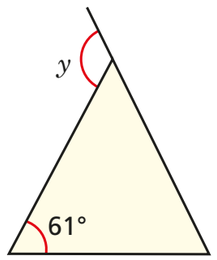
4 Work out the size of angle x.



x = 23·5°

5 Here is an isosceles triangle.

Find two possible sizes of angle y.

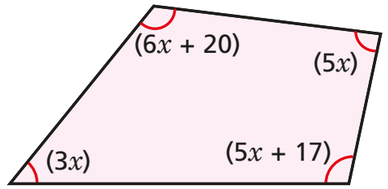


y = 122° or 120·5°

6 Form and solve equations to work out the value of x in each diagram.

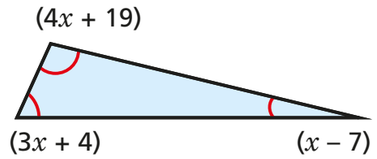
Show each step of your workings.

a)



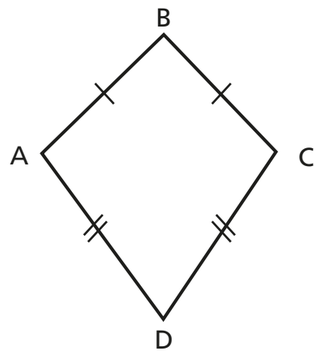
x = 17°

b)



x = 20·5°

7 ABCD is a kite.



a) Estimate the size of each angle in the kite.

∠ABC = 90° ∠BCD = 100°

∠CDA = 70° ∠DAB = 100°

b) Given that p = 20, write a possible expression for the size of each angle in terms of p.

e.g. ∠ABC = 4p + 10 ∠BCD = 5p

∠CDA = 3p + 10 ∠DAB = 5p

Compare answers with a partner.