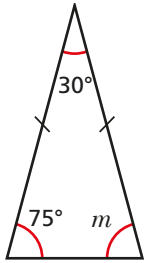
Angles in a triangle – special cases

1 Here is a triangle.



a) What type of triangle is it?

Isosceles

How do you know?

There are two sides of equal length.

b) Work out the size of angle m.

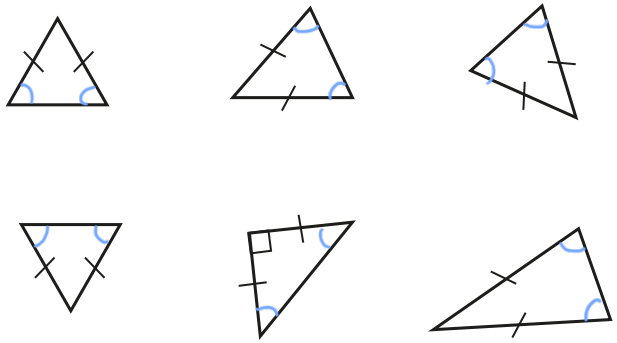
75°

c) What do you notice?

d) Complete the sentence to describe the angles in an isosceles triangle.

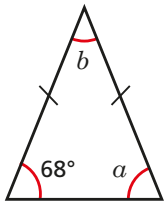
In an isosceles triangle two angles are equal.

2 Identify and label the angles that will be equal in each triangle.



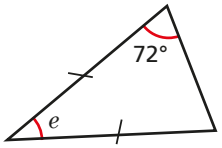
3 Work out the sizes of the unknown angles.

a)



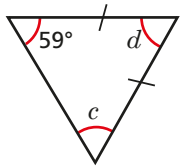
$a =$ 68° $b =$ 44°

c)



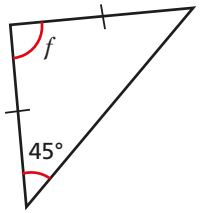
$e =$ 36°

b)



$c =$ 59° $d =$ 62°

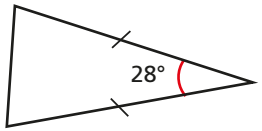
d)

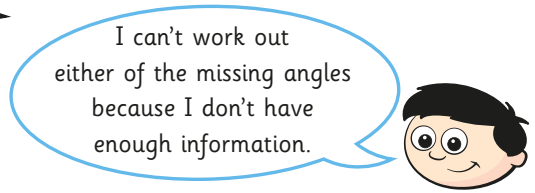


$f =$ 90°

Talk about your reasons with a partner.

4 Dexter is working out the unknown angles in triangles.





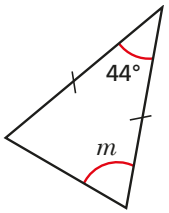
Do you agree with Dexter? NO

Explain your answer.

Both unmarked angles are equal, so 180 − 28 = 152 and 152 ÷ 2 = 76. Each missing angle is 76°

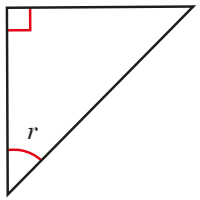
5 Work out the sizes of the unknown angles.

a)



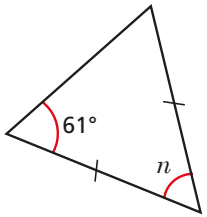
m = 68°

c)



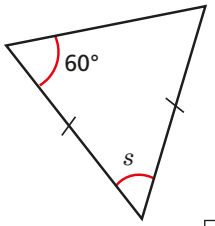
r = 45°

b)



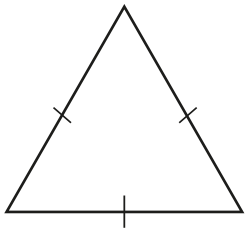
n = 58°

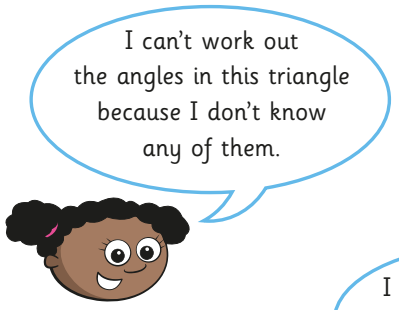
d)



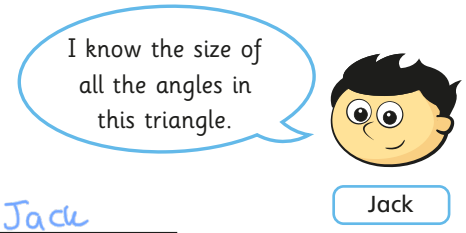
s = 60°

6 Whitney and Jack are working out the angles in this triangle.





Whitney



Jack

Who do you agree with? Jack

Talk about it with a partner.

7 Are the statements true or false?

a) Every isosceles triangle is equilateral. false

b) Every equilateral triangle is isosceles. true

c) A right-angled triangle can be equilateral. false

d) A right-angled triangle can be isosceles. true

Explain your answers to a partner.

8 Two angles in a triangle are 43° and 74°.

Is the triangle isosceles? No

Show your workings.

43 + 74 = 117

180 − 117 = 63

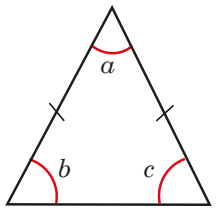
9 One angle in an isosceles triangle is 29°.

What could the other angles be? Give two possible answers.

29° and 122° or 75.5° and 75.5°

10 Angle b is twice the size of angle a.

Work out the size of angle c.



72°