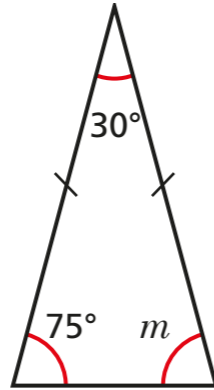# Angles in a triangle – special cases

1 Here is a triangle.

a) What type of triangle is it?

Isosceles

How do you know?

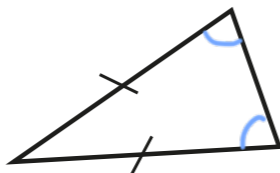_There are two sides of equal length._
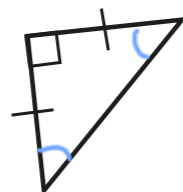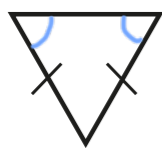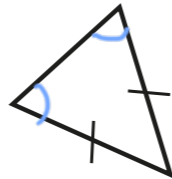
b) Work out the size of angle m.
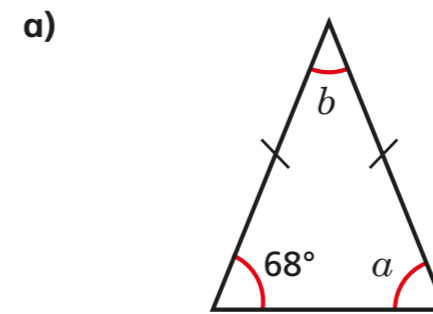
$75°$

c) What do you notice?

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

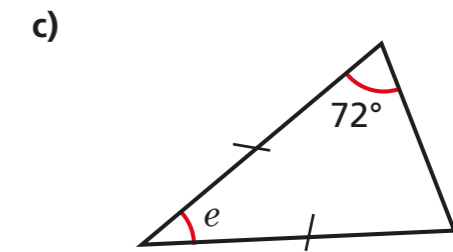In an isosceles triangle _two angles are equal._

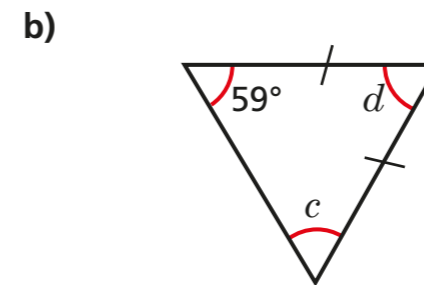**2** Identify and label the angles that will be equal in each triangle.
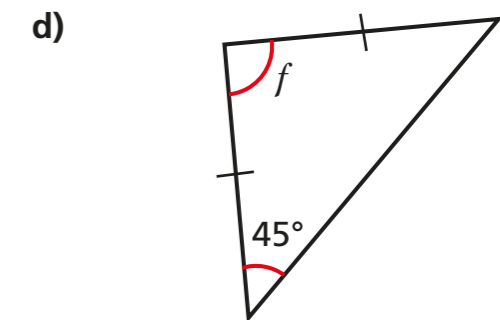
3 Work out the sizes of the unknown angles.

a)

$a = \boxed{68°}$ $b = \boxed{44°}$

c)

$e = \boxed{36°}$

b)

$c = \boxed{59°}$ $d = \boxed{62°}$

d)

$f = \boxed{90°}$
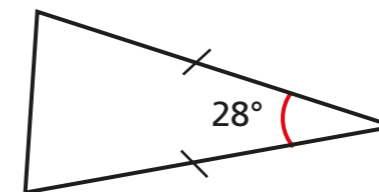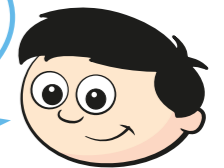
Talk about your reasons with a partner.

4 Dexter is working out the unknown angles in triangles.

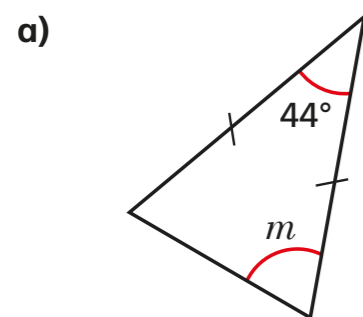> I can't work out either of the missing angles because I don't have enough information.
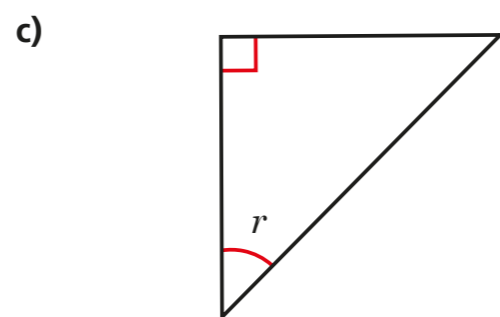
Do you agree with Dexter? _No_

Explain your answer.

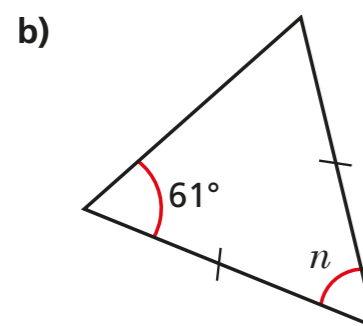_Both unmarked angles are equal so 180 − 28 = 152 and 152 ÷ 2 = 76. Each missing angle is 76°_
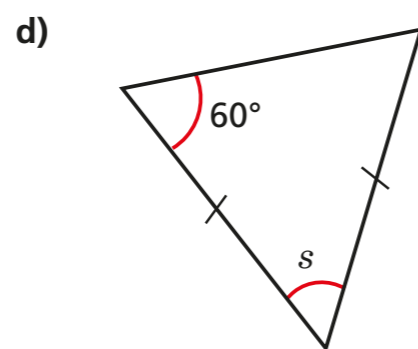
5 Work out the sizes of the unknown angles.

a)

44°

m

$m =$ **68°**

c)

r

$r =$ **45°**

b)

61°

n

$n =$ **58°**

d)

60°

s

$s =$ **60°**

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

I can't work out the angles in this triangle because I don't know any of them.

Whitney

I know the size of all the angles in this triangle.
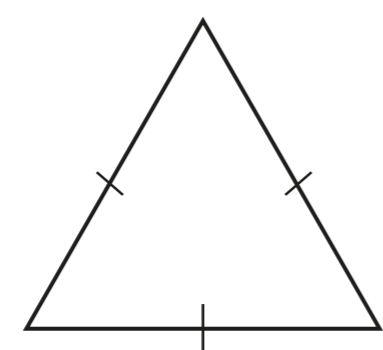
Jack

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.

a

b   *c*

72°