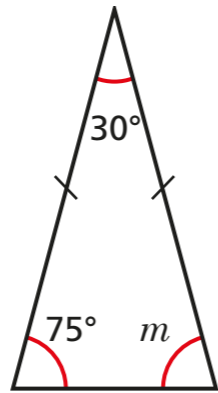# Angles in a triangle – special cases

1 Here is a triangle.

30°

a) What type of triangle is it?

Isosceles

How do you know?

There are two sides of equal length.

75°   *m*
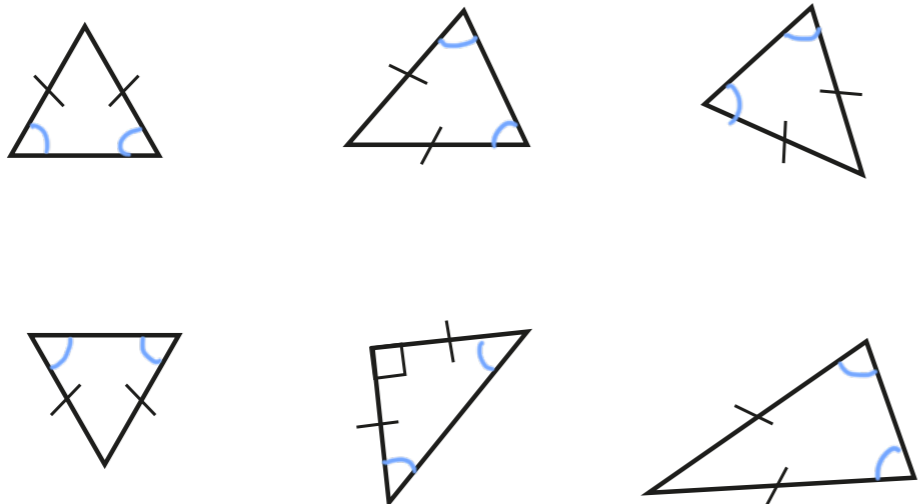
b) Work out the size of angle *m*.
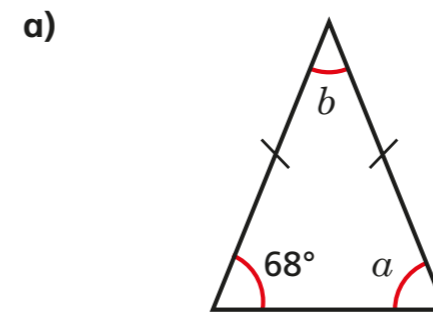
75°

c) What do you notice?

d) Complete the sentence to describe the angles in an isosceles triangle.
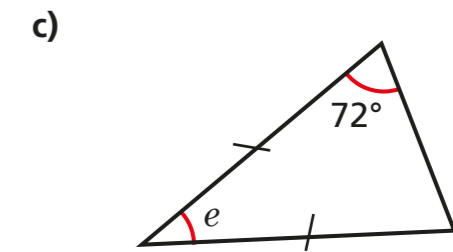
In an isosceles triangle two anges are equal.

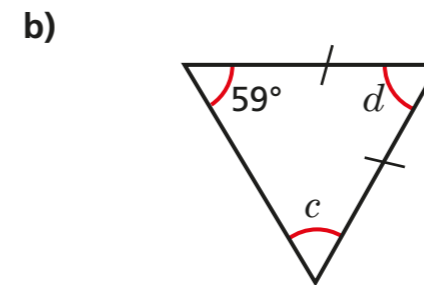**2** Identify and label the angles that will be equal in each triangle.
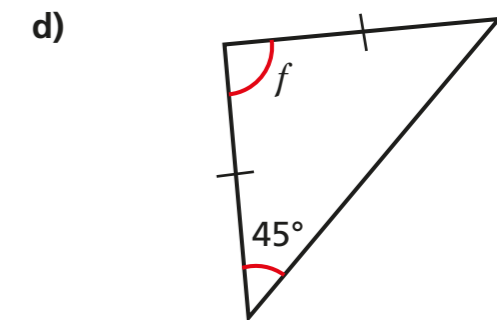
3 Work out the sizes of the unknown angles.

a)

b

68°   *a*

$a =$ 68° $b =$ 44°

b)

59°   *d*

c

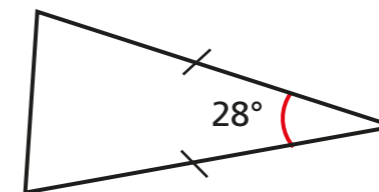$c =$ 59° $d =$ 62°

c)

72°

e

$e =$ 36°

d)

f

45°

$f =$ 90°

Talk about your reasons with a partner.

4 Dexter is working out the unknown angles in triangles.

28°

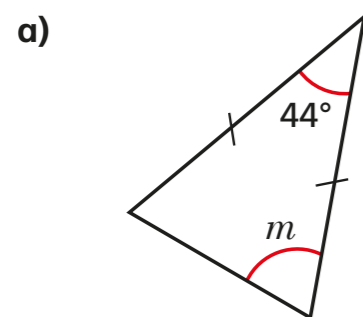I can't work out either of the missing angles because I don't have enough information.
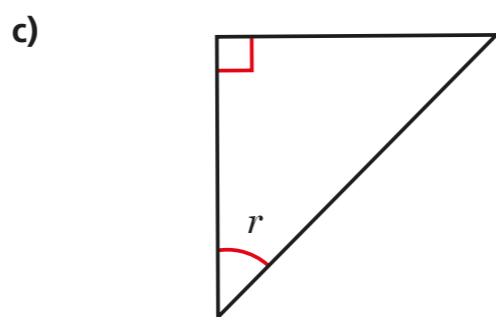
Do you agree with Dexter? No

Explain your answer.

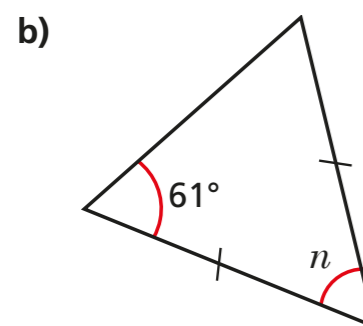Both unmarked angles are equal so 180 − 28 = 152 and 152 ÷ 2 = 76. Each missing angle is 76°
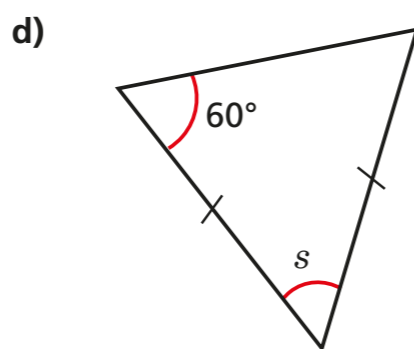
5 Work out the sizes of the unknown angles.

a)

44°

m

$m = \boxed{68°}$

c)

r

$r = \boxed{45°}$

b)

61°

n

$n = \boxed{58°}$

d)

60°

s

$s = \boxed{60°}$

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.
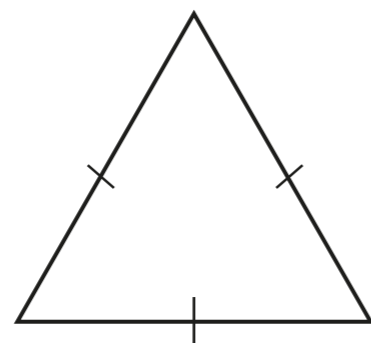
Jack

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__
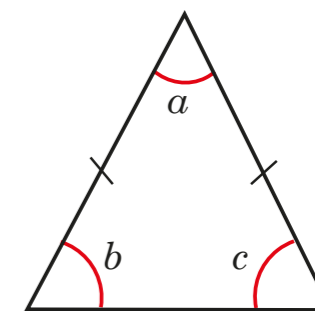
Show your workings.

$43 + 74 = 117$

$180 - 117 = 63$

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*

$\boxed{72°}$

White Rose Maths