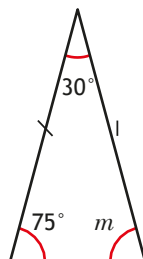


# Angles in a triangle – special cases

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  $m$ .

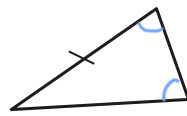
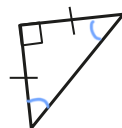
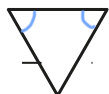
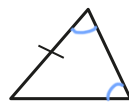
75°

c) What do you notice?

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

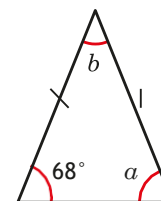
In an isosceles triangle two angles are equal.

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



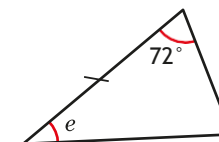
3 Work out the sizes of the unknown angles.

a)



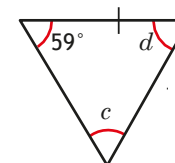
$a =$  68°  $b =$  44°

c)



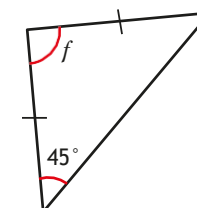
$e =$  36°

b)



$c =$  59°  $d =$  62°

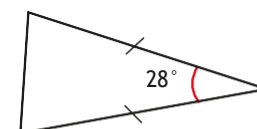
d)



$f =$  90°

Talk about your reasons with a partner.

4 Dexter is working out the unknown angles in triangles.



I can't work out either of the missing angles because I don't have enough information.



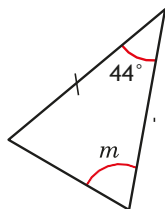
Do you agree with Dexter? NO

Explain your answer.

Both unmarked angles are equal so  $180 - 28 = 152$  and  $152 \div 2 = 76$ . Each missing angle is 76°

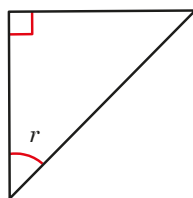
5 Work out the sizes of the unknown angles.

a)



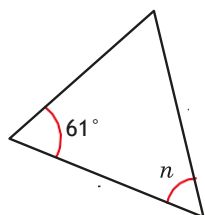
$$m = 68^\circ$$

c)



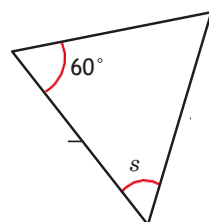
$$r = 45^\circ$$

b)



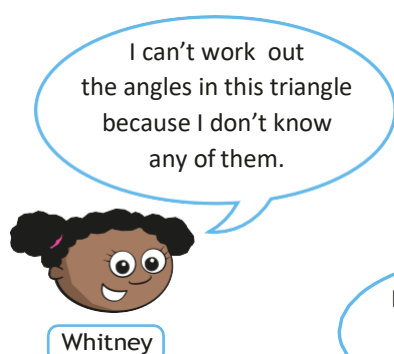
$$n = 58^\circ$$

d)

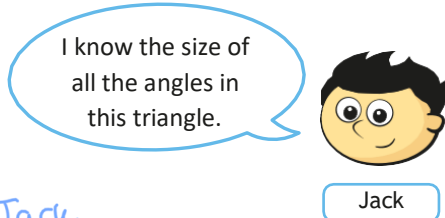
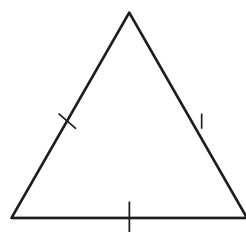


$$s = 60^\circ$$

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  $43^\circ$  and  $74^\circ$ .

Is the triangle isosceles? No

Show your workings.

$$\begin{aligned} 43 + 74 &= 117 \\ 180 - 117 &= 63 \end{aligned}$$

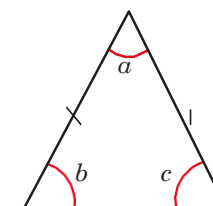
9 One angle in an isosceles triangle is  $29^\circ$ .

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

$29^\circ$  and  $122^\circ$  or  $75.5^\circ$  and  $75.5^\circ$

10 Angle  $b$  is twice the size of angle  $a$ .

Work out the size of angle  $c$ .



$$72^\circ$$