

# Warm Up Challenge

## Flashback 4

1) Round 7.18 to the nearest whole number

2) Write 0.07 as a fraction

3) Find the sum of  $\frac{1}{3}$ ,  $\frac{1}{5}$  and  $\frac{1}{6}$

4) What is the mathematical name of the shape?



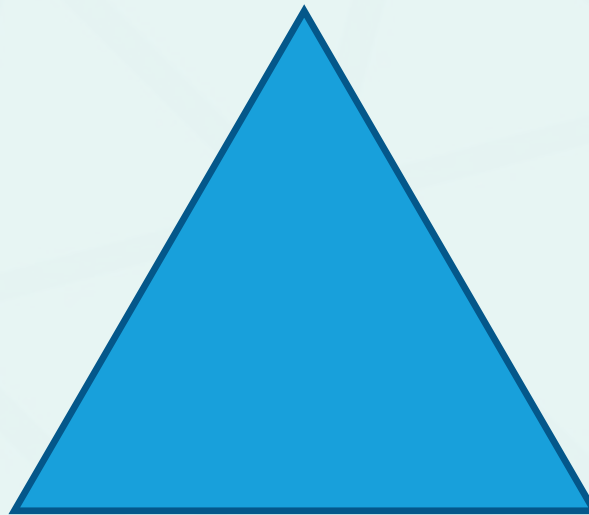
Activate Windows  
Go to Settings to activate Windows.



# What Is a Triangle?

a 3-sided  
shape

all its sides  
are straight



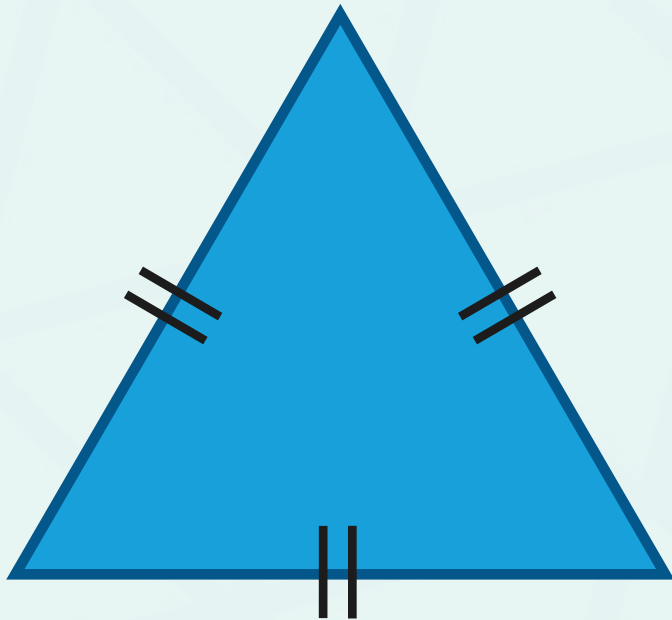
a 2D shape

has 3 **interior  
angles\*** that  
add up to  
180°

\*the angles inside the shape

# Equilateral Triangle

Do you think you know any properties of equilateral triangles?  
What do you think **equilateral** means?



Has 3 equal sides.

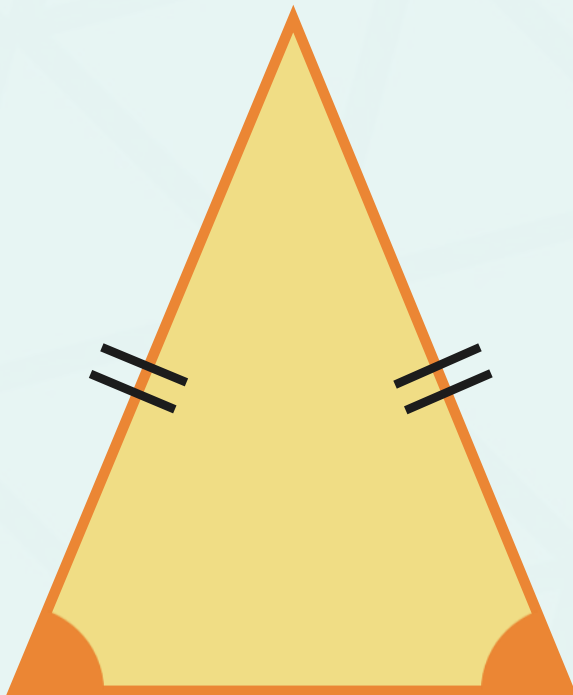
All its interior angles are the same.

If the angles in a triangle add up to  $180^\circ$ , what must each interior angle in an equilateral triangle be?

**$60^\circ$**

# Isosceles Triangle

Do you think you know any properties of isosceles triangles?

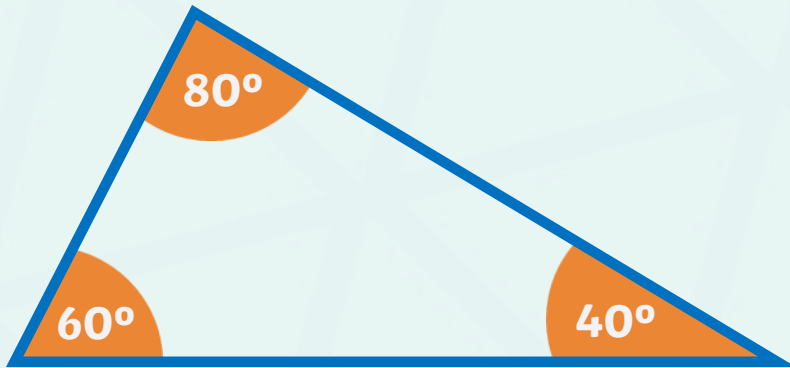


They have 2 equal sides.

They have 2 interior angles that are the same. These are called the base angles.

# Scalene Triangle

Do you think you know any properties of scalene triangles?



All of its sides are different lengths.

All of its interior angles are different – but they still add up to  $180^\circ$ .

# Right-Angled Triangle

Do you think you know any properties of right-angled triangles?

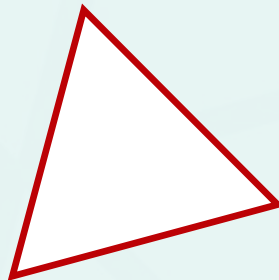
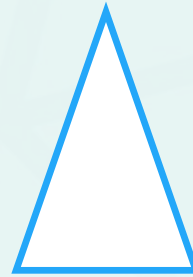
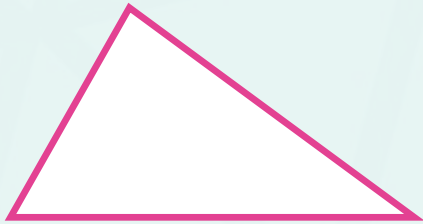


One of the angles is a right angle =  $90^\circ$ .

The other two angles will add up to  $90^\circ$

The longest side of a right-angled triangle is called the hypotenuse.

# Can You Identify These Triangles?



# What Am I?

Each of my interior angles measure  $60^\circ$ . What am I?

**I am an equilateral triangle.**

I am the longest side of a right-angled triangle. What am I?

**I am the hypotenuse.**

The lengths of all my three sides are different. What am I?

**I am a scalene triangle.**

My interior angles measure  $43^\circ$ ,  $65^\circ$  and  $72^\circ$ . What am I?

**I am a scalene triangle.**

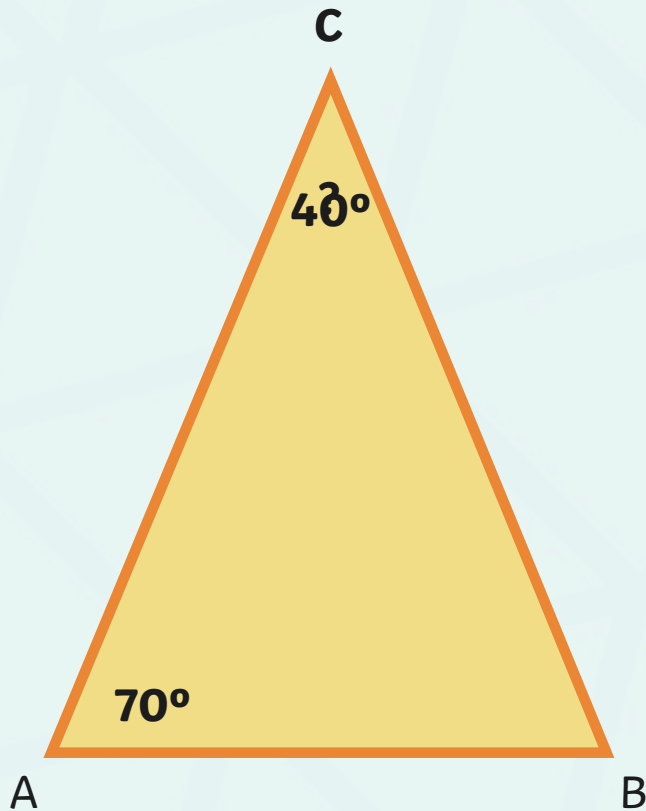
I have 2 equal sides and 2 equal angles. What am I?

**I am an isosceles triangle.**



# Find the Missing Angle

The angles in any triangle add up to  $180^\circ$ . How could we find angle **C** in this triangle?



What do we know that can help us?

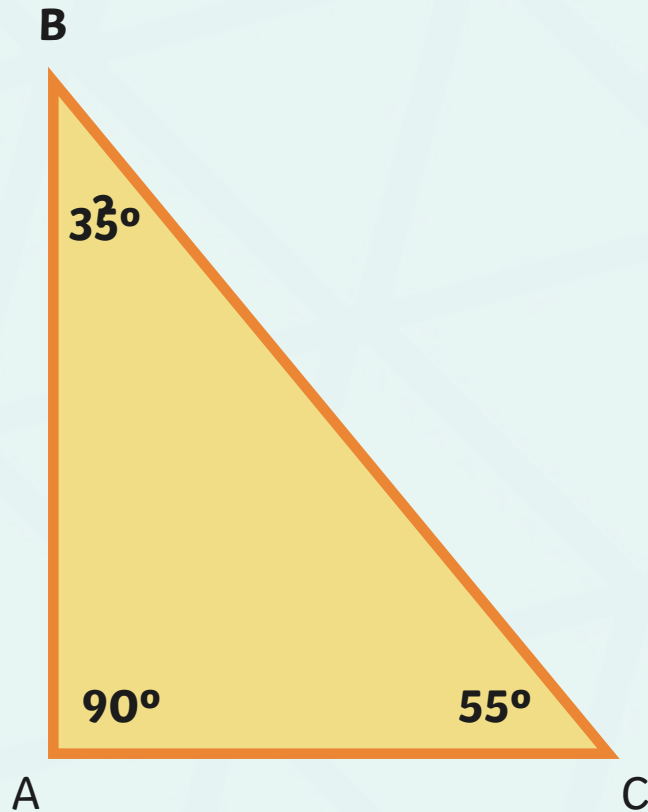
This is an isosceles triangle so angle A and B are the same.  
Angle B is also  $70^\circ$ .

Add up the two angles you know:  
 $70^\circ + 70^\circ = 140^\circ$

Take this away from  $180^\circ$  to find the missing angle  
 $180^\circ - 140^\circ = 40^\circ$   
This is an **acute** angle.

# Find the Missing Angle

How could we find angle B in this triangle?



What do we know that can help us?

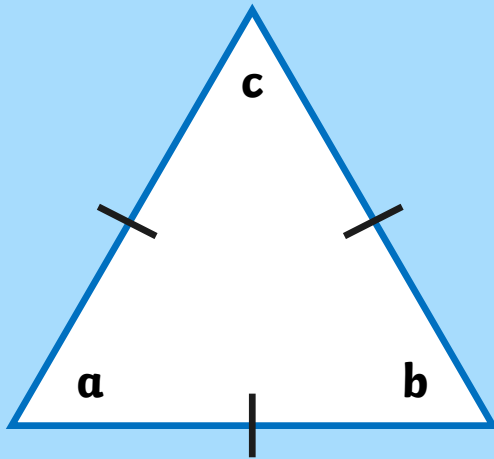
This triangle is a right-angled scalene triangle.

Add together the angles we already know:  
 $90^\circ + 55^\circ = 145^\circ$

Take this away from  $180^\circ$  to find the missing angle.  
 $180^\circ - 145^\circ = 35^\circ$   
This is an **acute** angle

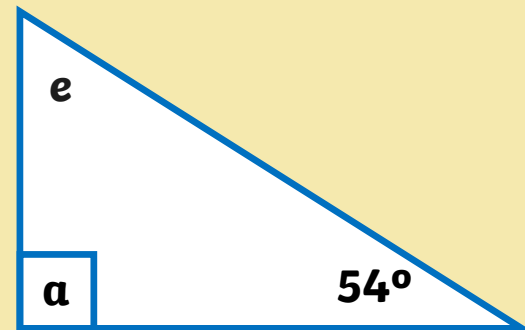
# Calculate the Missing Angles

1. Calculate angles **a**, **b** and **c**.  
What types of angles are they?



This is an equilateral triangle,  
so all the angles are **60°**.  
These are **acute** angles.

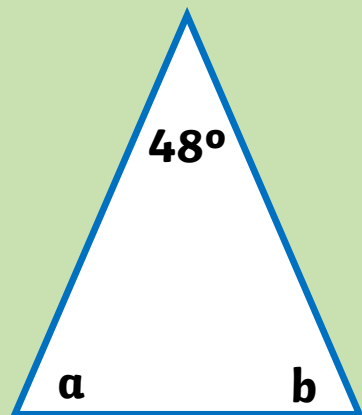
2. Calculate angle **e**.  
What type of angle is it?



This is a right-angled  
scalene triangle.  
 $90^\circ + 54^\circ = 144^\circ$   
 $180^\circ - 144^\circ = \mathbf{36^\circ}$   
It is an **acute** angle.

## Calculate the Missing Angles

3. Calculate angles **a** and **b**.  
What type of angles are they?



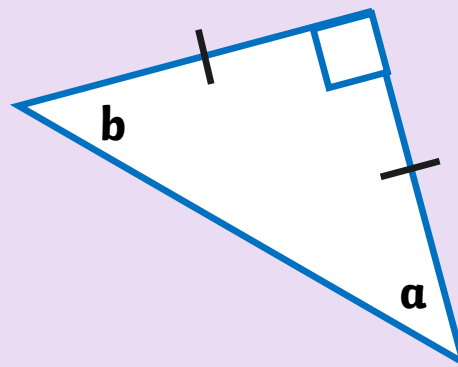
This is an isosceles triangle, so angles **a** and **b** are the same.

$$180^\circ - 48^\circ = 132^\circ$$

$$132^\circ \div 2 = \mathbf{66^\circ}$$

They are **acute** angles.

4. Calculate angles **a** and **b**.  
What type of angles are they?



This is a right-angled isosceles triangle.

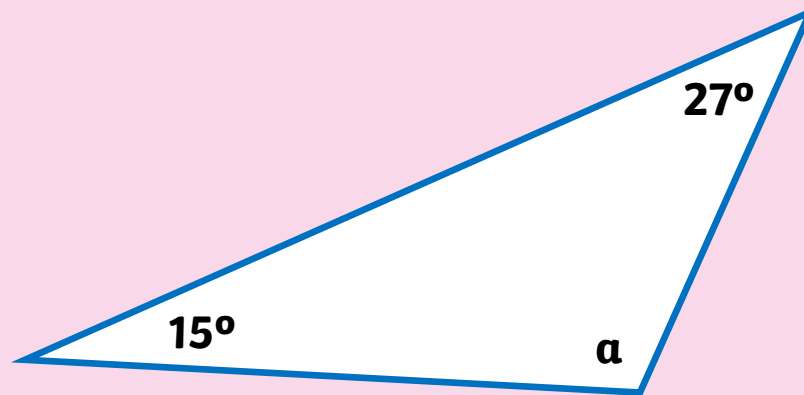
$$180^\circ - 90^\circ = 90^\circ$$

$$90^\circ \div 2 = \mathbf{45^\circ}$$

They are **acute** angles.

# Calculate the Missing Angles

5. Calculate angle **a**. What type of angle is this?



This is a scalene triangle.

$$27^\circ + 15^\circ = 42^\circ$$

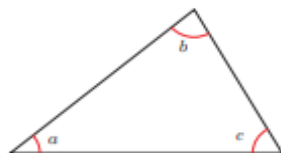
$$180^\circ - 42^\circ = \mathbf{138^\circ}$$

This is an **obtuse** angle.

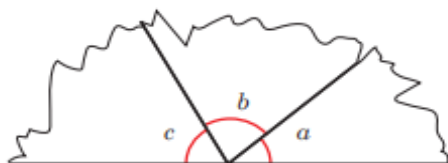
# Independent Activity: Turn to page 10 in your work pack to answer the questions

## Angles in a triangle

- 1 Here is a triangle.



- a) The three vertices are torn off the triangle and arranged on a straight line.



What is the sum of the three angles?

How do you know?

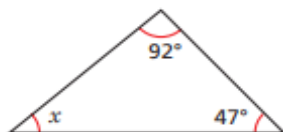
- b) Now measure the sizes of angles  $a$ ,  $b$  and  $c$  in the triangle.  
c) What is the total of angles  $a$ ,  $b$  and  $c$ ?  
d) Complete the sentence.

Angles in a triangle \_\_\_\_\_

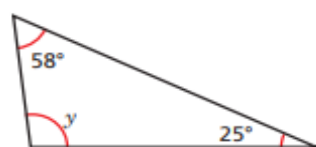
- 2 Work out the sizes of the unknown angles.

Give reasons for your answers.

a)



b)



c)

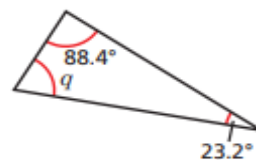


d)

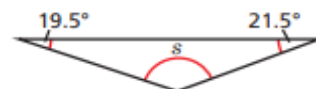


- 3 Work out the unknown angles.

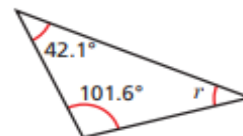
a)



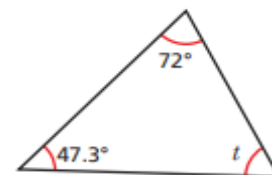
c)



b)



d)



Discuss your reasons with a partner.

- 4 a) Two angles in a triangle are  $42^\circ$  and  $57^\circ$ .

What is the size of the third angle?

- b) Two of the angles in a triangle are  $12^\circ$ .

What is the size of the third angle?

- c) One of the angles in a triangle is  $38^\circ$ . Another angle is twice the size of the first angle.

What is the size of the third angle?