

## Sum of Angles of a Triangle

### Objectives:

- To recognise that the sum of the angles in a triangle is  $180^\circ$
- To find an unknown angle of a triangle given the other two angles

### Thinking Skills:

- Analysing parts and wholes
- Induction

### Materials:

- Triangle cut-outs (see CB p.21 on how to use technology to draw triangles)
- Markers of three different colours
- Ruler or straight edge

### Classroom Organisation:

Class discussion



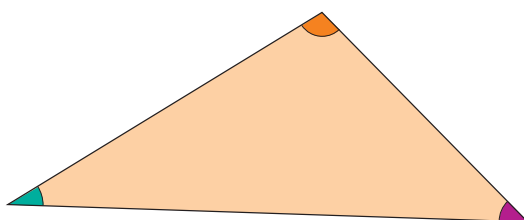
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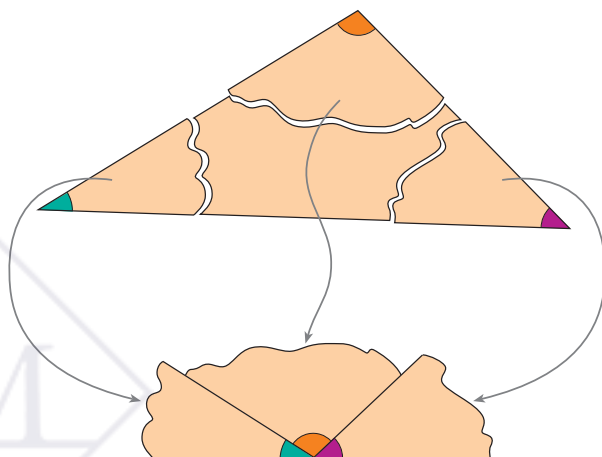
**Digital Coursebook 6B,  
Chapter 1**

## Sum of Angles of a Triangle

Cut out a triangle and colour each angle in a different colour.



Tear the triangle as shown below.



What do you notice when you arrange the three angles like this? **The angles add up to  $180^\circ$ .**

#### My Notes

The sum of the angles of a triangle is  $180^\circ$ .

### Lesson:

- Get pupils to work in pairs and follow these steps.
  - (i) Distribute a triangle cut-out to each pair of pupils.
  - (ii) Get pupils to show their triangles to the class and describe their triangles.  
For example:  
*We have a fat triangle.*  
*We have a long thin triangle.*  
*Our triangle has a right angle.*  
*Our triangle has equal sides.*
  - (iii) Get pupils to mark the three angles of their triangles in three different colours.
  - (iv) Get them to tear out the angles carefully.
  - (v) Arrange the angles along the side of a ruler.  
*What can you say about the sum of the three angles of your triangle?*
  - (vi) Lead pupils to see that the property applies to any triangle.  
*What can you say about the sum of the three angles of any triangle?*
- Get pupils to read aloud the sentence in the text box at the bottom of CB p.11.

## Classroom Organisation:

Class discussion

## Note:

In each of the following practice questions (CB p.12 to 15), get pupils to:

- check that their answers are reasonable. For example, if an unknown angle looks greater than  $90^\circ$ , their answer should be greater than  $90^\circ$ .
- write down their solution properly.

P

Q

R

S

Use these cards to name the angles.  
 $\angle a = \angle RPQ$   
 For  $\angle a$ , the middle letter must be P.

Try these yourself.

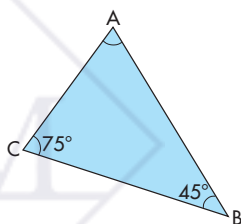
$\angle b = \angle$  P Q R

$\angle c = \angle$  P R Q or Q R P

$\angle d = \angle$  P R S

The following figures are not drawn to scale.

- 2 a)** In Triangle ABC,  $\angle ACB = 75^\circ$  and  $\angle ABC = 45^\circ$ . Find  $\angle BAC$ .

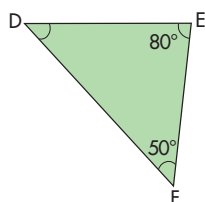


The sum of angles of a triangle is  $180^\circ$ .

$$\begin{aligned}\angle BAC &= 180^\circ - 75^\circ - 45^\circ \\ &= 60^\circ\end{aligned}$$



- b)** In Triangle DEF,  $\angle DEF = 80^\circ$  and  $\angle EFD = 50^\circ$ . Find  $\angle FDE$ .



$$\begin{aligned}\angle FDE &= 180^\circ - 80^\circ - 50^\circ \\ &= 50^\circ\end{aligned}$$

## Practice:

- Show pupils how an angle can be labelled in a different way by using three **capital** letters.

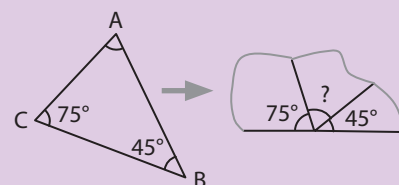
For example, QP and PR are sides of  $\angle a$ . The two sides meet at point **P**. Therefore,  $\angle a$  can also be named as  $\angle RPQ$  or  $\angle QPR$ .

Have pupils attempt to name the other three angles. Show them how to check their answers.

For example:

*Put your finger on  $\angle b$ . What is the letter there? Look at your answer. Is Q between the other two letters?*

- Q2 – If pupils have difficulty understanding why the unknown angle can be found by subtracting the two given angles from  $180^\circ$ , use cut-outs as follow to illustrate the process:



$$\angle CAB = 180^\circ - 75^\circ - 45^\circ$$

4 Fill in the boxes.

a) $4 \ell =$ <input type="text" value="4000"/> $\text{cm}^3$	b) $12 \ell =$ <input type="text" value="12 000"/> $\text{cm}^3$
c) $\frac{3}{10} \ell =$ <input type="text" value="300"/> $\text{cm}^3$	d) $1\frac{4}{5} \ell =$ <input type="text" value="1800"/> $\text{cm}^3$
e) $0.4 \ell =$ <input type="text" value="400"/> $\text{cm}^3$	f) $3.9 \ell =$ <input type="text" value="3900"/> $\text{cm}^3$
g) $1 \ell 230 \text{ ml} =$ <input type="text" value="1230"/> $\text{cm}^3$	h) $3 \ell 75 \text{ ml} =$ <input type="text" value="3075"/> $\text{cm}^3$
i) $4500 \text{ cm}^3 =$ <input type="text" value="4"/> $\ell$ <input type="text" value="500"/> $\text{ml}$	j) $24\,025 \text{ cm}^3 =$ <input type="text" value="24"/> $\ell$ <input type="text" value="25"/> $\text{ml}$

For Questions 5 and 6, calculator is permitted.

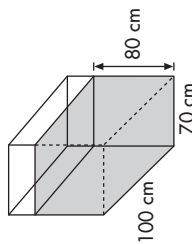
5 Find the volume of water in the rectangular tank. Give your answer in litres. (1 litre =  $1000 \text{ cm}^3$ )

$$100 \times 70 \times 80$$

$$= 560\,000 \text{ cm}^3$$

$$= 560 \ell$$

The volume of water in the rectangular tank is  $560 \ell$ .



6 A tank measures 20 cm by 15 cm by 8 cm. The tank contains  $1800 \text{ cm}^3$  of water. How many more millilitres of water must be added to fill the tank completely?

$$20 \times 15 \times 8 = 2400 \text{ cm}^3$$

The capacity of the tank is  $2400 \text{ cm}^3$ .

$$2400 - 1800 = 600 \text{ cm}^3$$

$$= 600 \text{ ml}$$

600 ml more water must be added to fill the tank completely.

