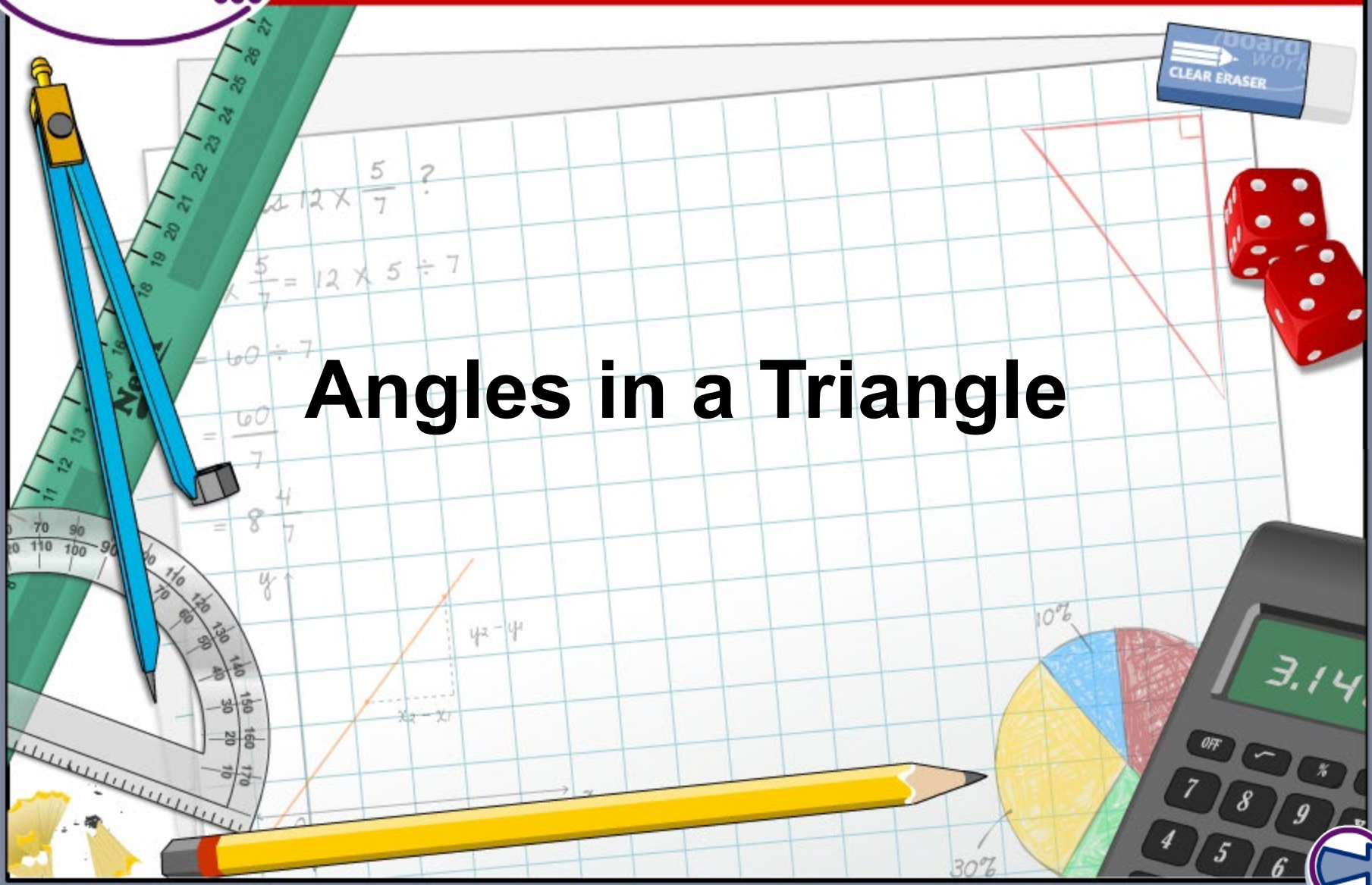


Angles in a Triangle

Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

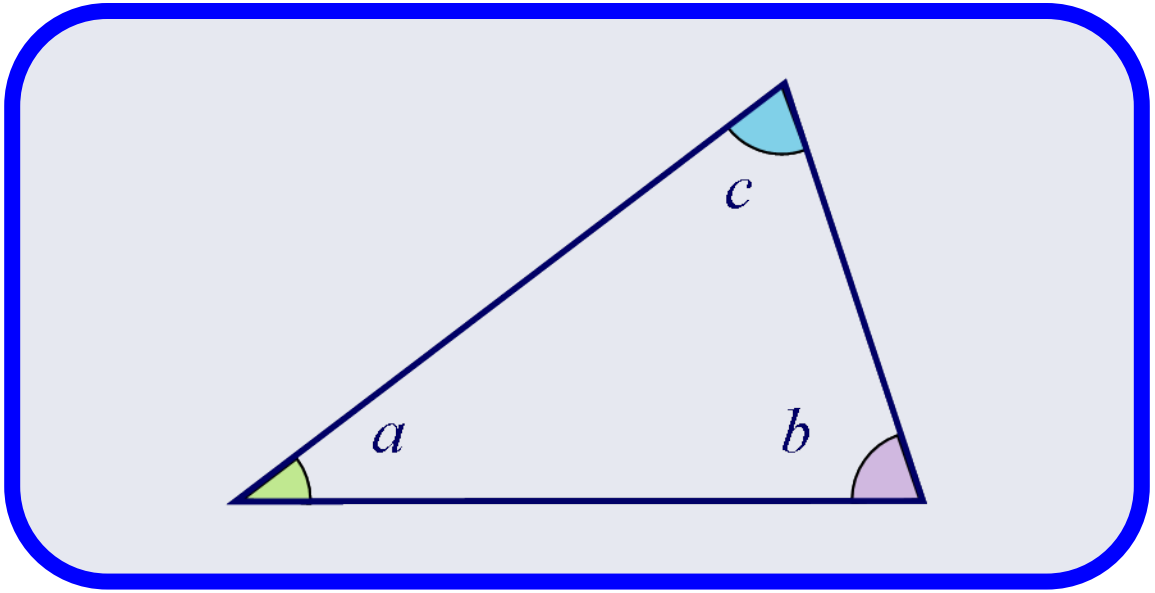
This icon indicates teacher's notes in the Notes field.

Types of triangle

equilateral	isosceles	scalene
right	acute	obtuse

Triangles can be categorized according to their side lengths or their angles. Press the terms to find out more about the properties they describe.

Angles in a triangle



For any triangle:

$$a + b + c = 180°$$

The angles in a triangle add up to 180°.

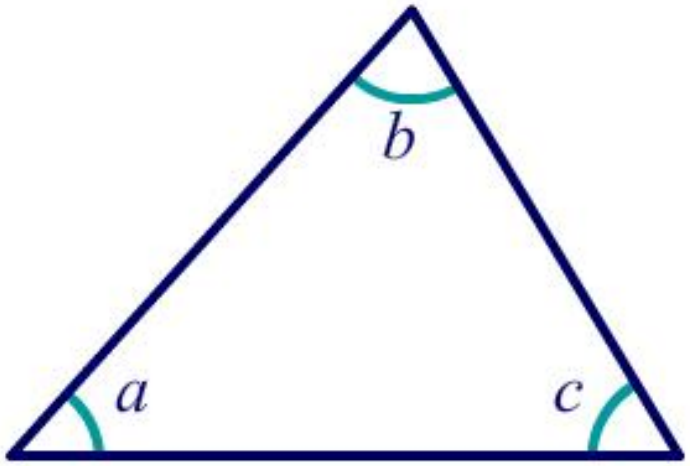
Can you prove this?

Angles in a triangle

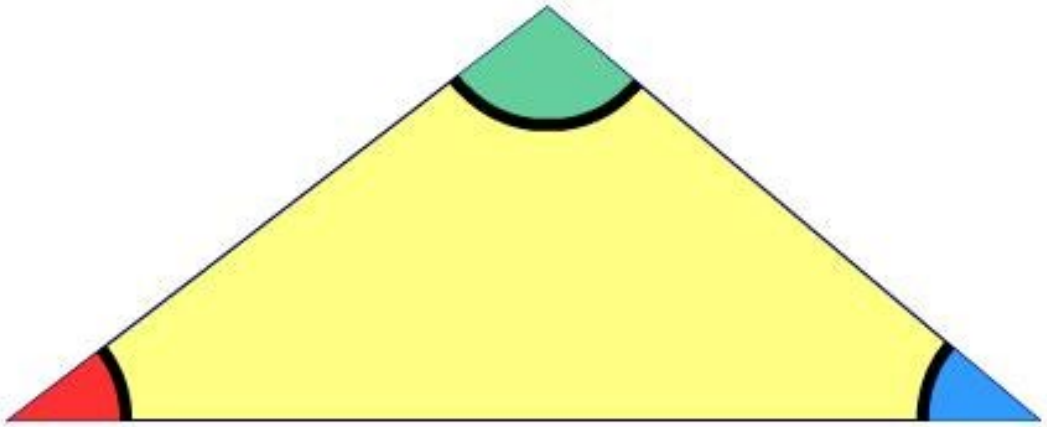
The interior angles in a triangle add up to 180°.

$a + b + c = 180°$

Press **play** to see how to prove that this is true.

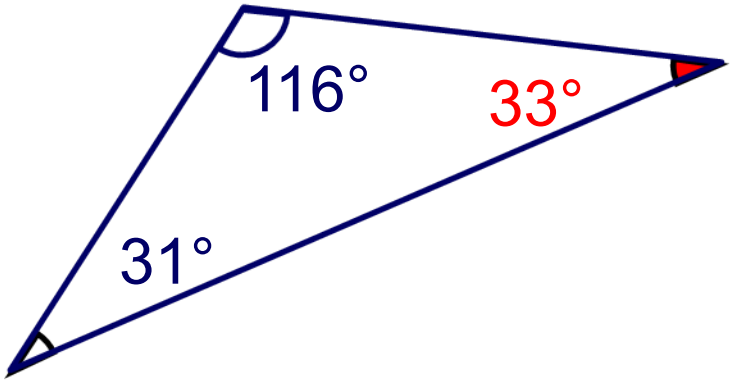


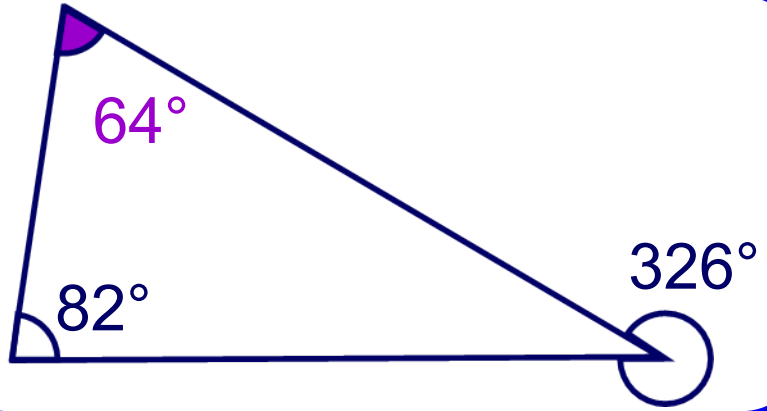
Angles in a triangle

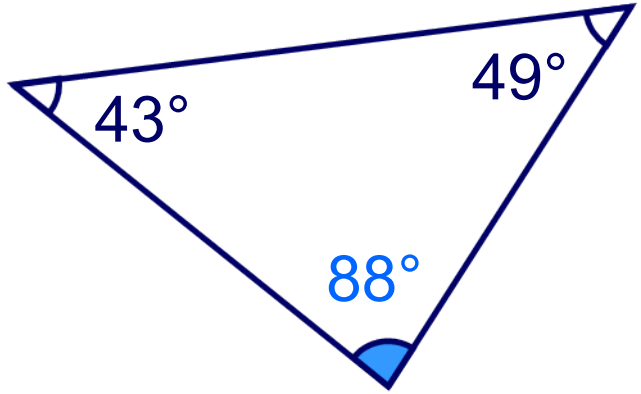


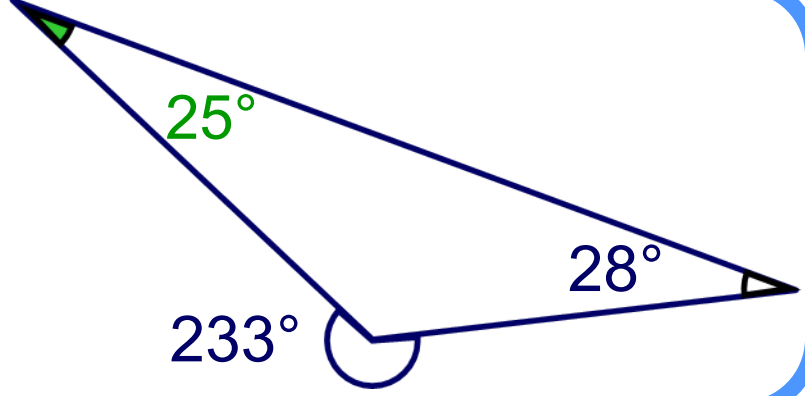
Calculating angles in a triangle

Find the measures of the missing angles in each of the following triangles.



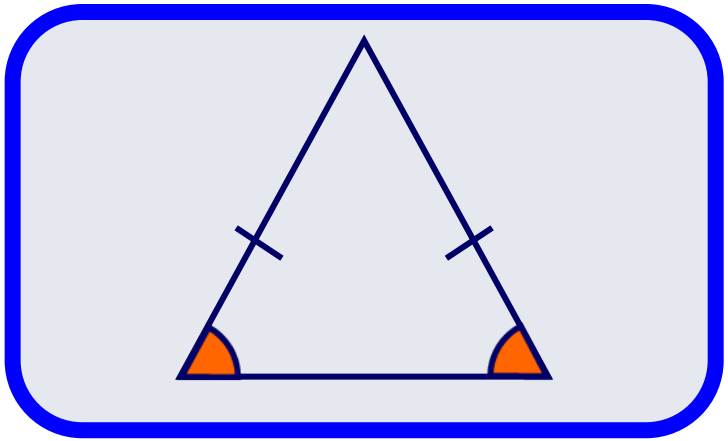






Angles in an isosceles triangle

In an **isosceles triangle**, two of the sides are equal.

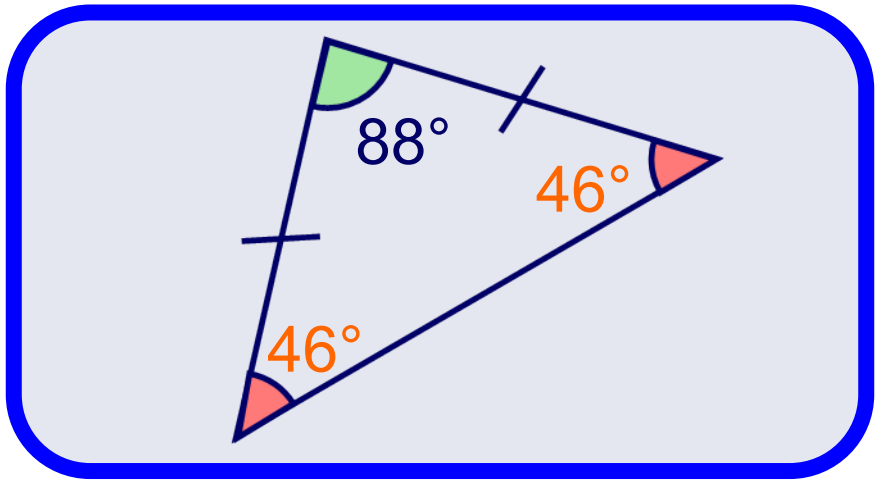


We indicate the equal sides by drawing tick marks on them.

The two angles at the bottom of the equal sides are called **base angles**. The two base angles are also equal.

If we are told one angle in an isosceles triangle, we can find the other two.

Angles in an isosceles triangle



Find the measures of the other two angles.

The two unknown angles are equal, so call them both a.

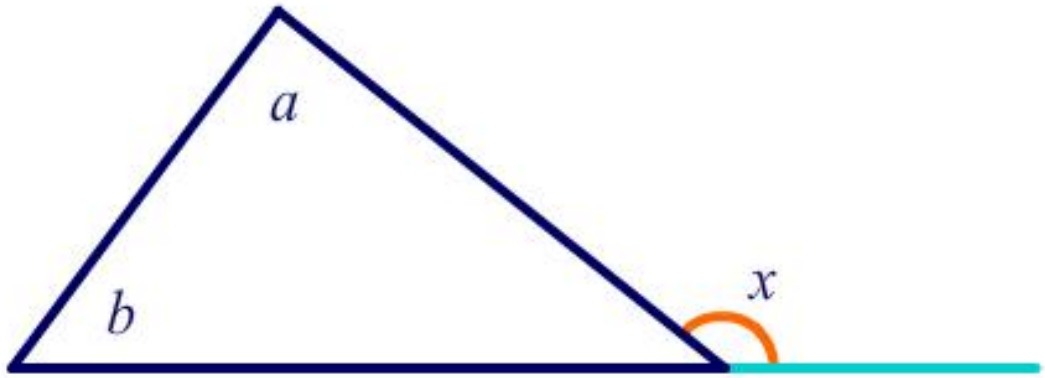
We can use the fact that the angles in a triangle add up to 180° to write an equation.

$$88° + a + a = 180°$$
$$88° + 2a = 180°$$
$$2a = 92°$$
$$a = 46°$$

Exterior angles of a triangle

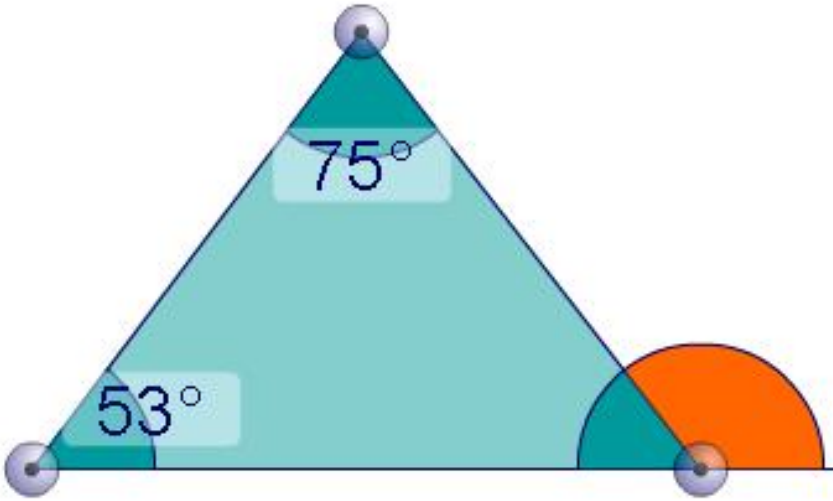
Any exterior angle in a triangle is equal to the sum of the two opposite interior angles.

Press **play** to see the proof.



Interior and exterior angles

Drag the points to move the triangle.
Click the angles to show or hide their size.



Calculating angles

A gardener wants to plant a triangular hedge in an ornamental garden. He wants two sides of the hedge to be of equal lengths. One angle should be 94°. Can you find the other two angles of the hedge?

$$94° + x + x = 180°$$

$$94° + 2x = 180°$$

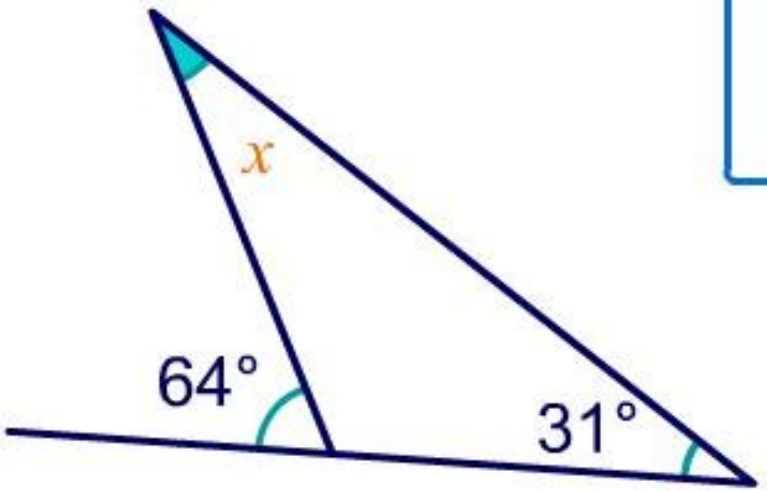
$$2x = 86°$$

$$x = 43°$$

Calculating angles

Question: 1/3

What is angle x?



Click the "=" button to show the work step by step.

47° | 29°

33° | 38°