

Professor Pythagoras' Mathematical Marvels

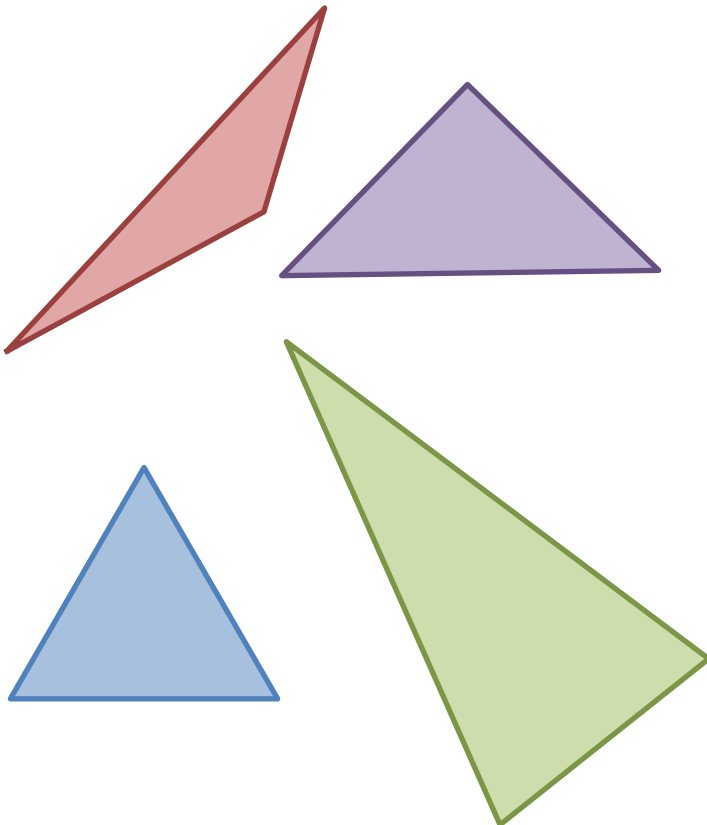
Pythagoras back again! I hope you enjoyed playing your game of Rota!

This week, I want to talk to you about my favourite thing in the whole world: TRIANGLES.



'Tri', which in both Latin and Ancient Greek means 'three' gives us some connected words in English. Can you think of any?

Today, I'm going to get you to demonstrate some amazing things about triangles. But first of all, a quiz...



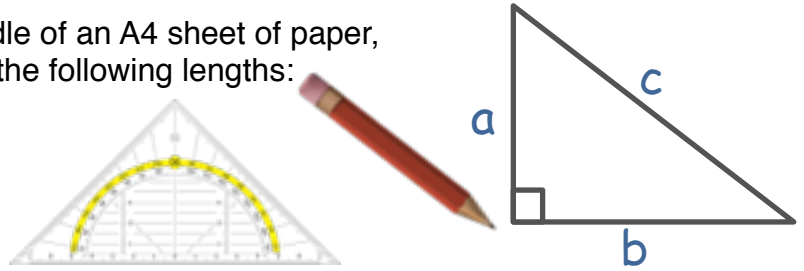
Find the triangle that has:

- three equal sides and angles (equilateral triangle)
- an obtuse angle
- a right angle
- two equal sides and angles (isosceles triangle)

Years 5 & 6: Pythagoras' Theorem

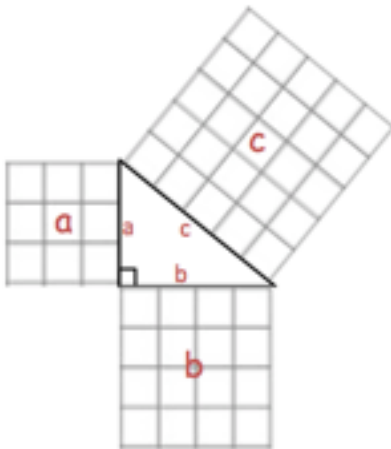
Step 1: Using a set square, in the middle of an A4 sheet of paper, draw a right-angled triangle with sides the following lengths:

- OPTION 1: a=3cm, b=4cm, c=5cm
- OPTION 2: a=6cm, b=8cm, c=10cm
- OPTION 3: a=9cm, b=12cm, c=15cm



Step 2: Next, take some 1cm squared paper. You're going to draw and cut out three squares:

- For **square a**, draw the sides the same length as side a on your triangle. Label the square with an 'a'. Cut out the square.
- For **square b**, draw the sides the same length as side b on your triangle. Label the square with a 'b'. Cut out the square.
- For **square c**, draw the sides the same length as side c on your triangle (the hypotenuse). Label the square with a 'c'. Cut out the square.



Step 3: Put square a against side a of your triangle. Put square b against side b, and square c against side c. You should have something that looks like this picture.

Step 4: Work out the number of centimetre squares in square a, square b and square c. You can do this either by counting the individual squares, or by multiplying the sides.

square a = cm²

square b = cm²

square c = cm²

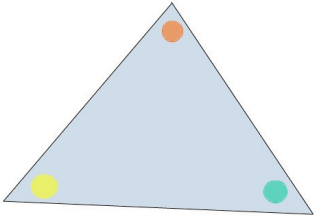
Step 5: Add the number of squares in square a and square b together

(square a) cm² + (square b) cm² = cm²

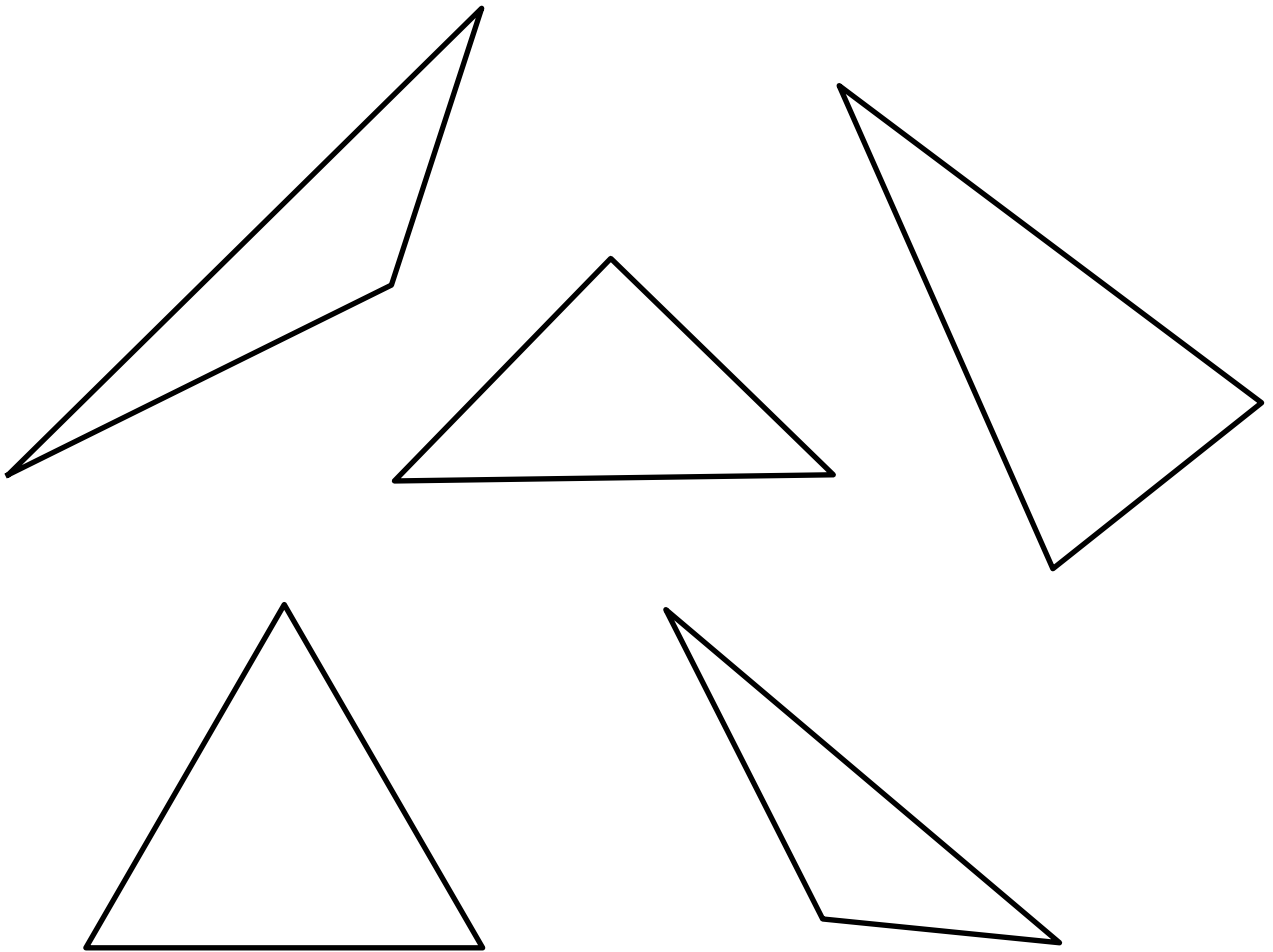


Have you noticed the same thing I did? I worked out that the squares on the two small sides of a right-angled triangle always add up to the number of squares on the long side (the hypotenuse).

Years 3 & 4: Angles in a triangle

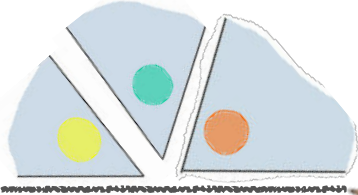
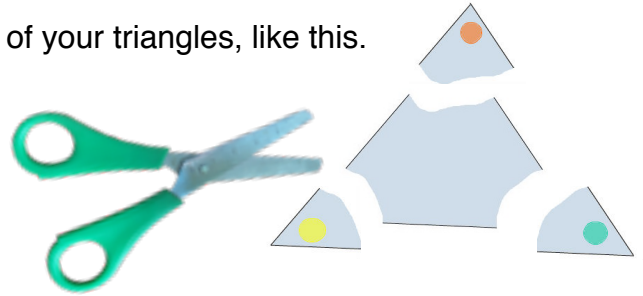


Step 1: Colour these five triangles below, making sure each is a different colour. Mark each angle with a dot, like this. Then cut your coloured, dotted triangles out.



Years 3 & 4: Angles in a triangle

Step 2: Snip the three angles off each of on of your triangles, like this.



Step 3: Draw a straight line (also known as an angle of 180 degrees) with a ruler and put all of the points together, so they sit on it, like this.

The Big Challenge: In the space below, can you arrange all three points of every triangle you've cut out in the same way?



Have you noticed the same thing I did? I worked out that whatever shape triangle you use, if you put the angles together, they'll always sit on a straight line and add up to 180 degrees!