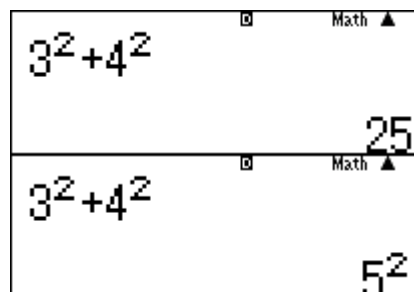


Module 3 : The concept of congruence
Part B – The converse of the Pythagorean theorem

The Pythagorean theorem is one of the oldest known formulas in mathematics. It is the right triangle relationship defined by $a^2 + b^2 = c^2$ where a and b are the legs of the right triangle and c is the hypotenuse (longest side).

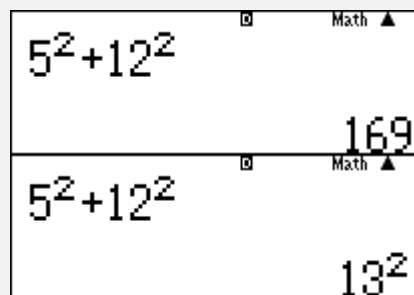
3 **x²** **+** **4** **x²** **=** **SHIFT** **□** (FACT)



Calculator screen showing the calculation of $3^2 + 4^2$. The top screen displays $3^2 + 4^2$ and the result 25. The bottom screen displays $3^2 + 4^2$ and the result 5^2 .

To prove a triangle is a right triangle use the Pythagorean Theorem and confirm the relationship $a^2 + b^2 = c^2$.

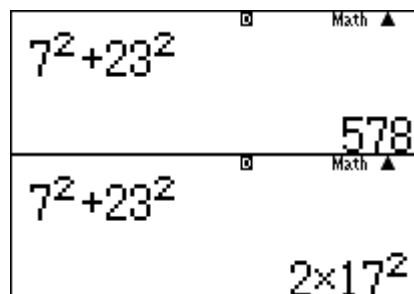
5 **x²** **+** **1** **2** **x²** **=** **SHIFT** **□**



Calculator screen showing the calculation of $5^2 + 12^2$. The top screen displays $5^2 + 12^2$ and the result 169. The bottom screen displays $5^2 + 12^2$ and the result 13^2 .

In this example the product is not a perfect square so the triangle is not a right triangle.

7 **x²** **+** **2** **3** **x²** **=** **SHIFT** **□**



Calculator screen showing the calculation of $7^2 + 23^2$. The top screen displays $7^2 + 23^2$ and the result 578. The bottom screen displays $7^2 + 23^2$ and the result 2×17^2 .

You can use the calculator to help solve for a missing leg in the theorem by subtracting from the hypotenuse.

$$12^2 + b^2 = 13^2$$

$$b^2 = 13^2 - 12^2$$

$$b^2 = 169 - 144$$

$$b^2 = 25$$

$$b = 5$$

1 **3** **x²** **-** **1** **2** **x²** **=** **SHIFT** **□**

