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Math Explorations



Dr. Julien Fleron

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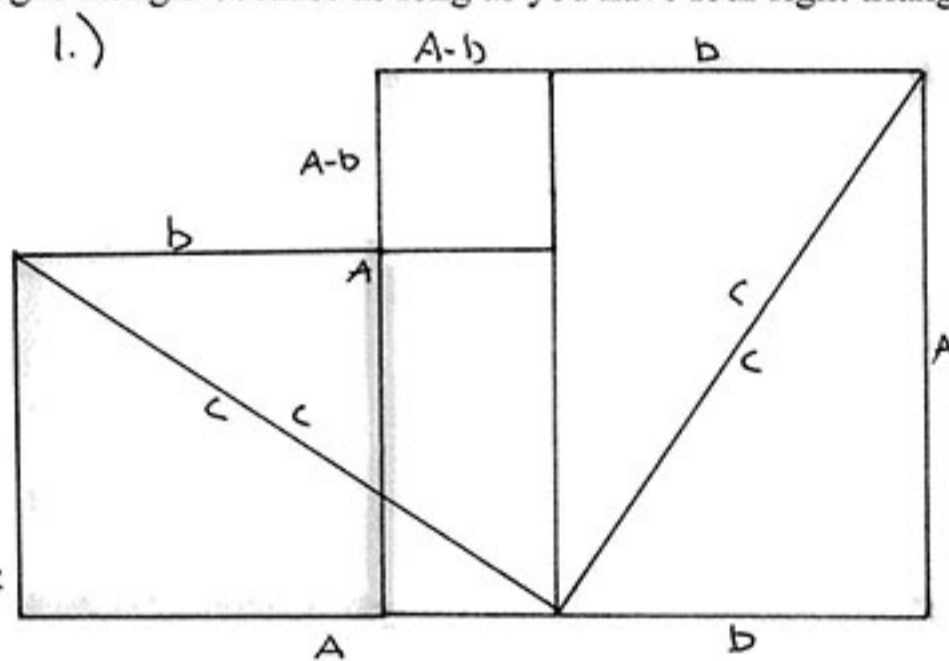
Pythagorean Theorem

Conjecture: The Pythagorean Theorem States that $A^2 + B^2 = C^2$, this theorem works for all right triangles.

Proof: The Pythagorean Theorem works because you can make two perfect squares from the right triangles. This works for any right triangle because as long as you have four right triangles you can make a square.

$= A^2$  $= B^2$  $= C^2$

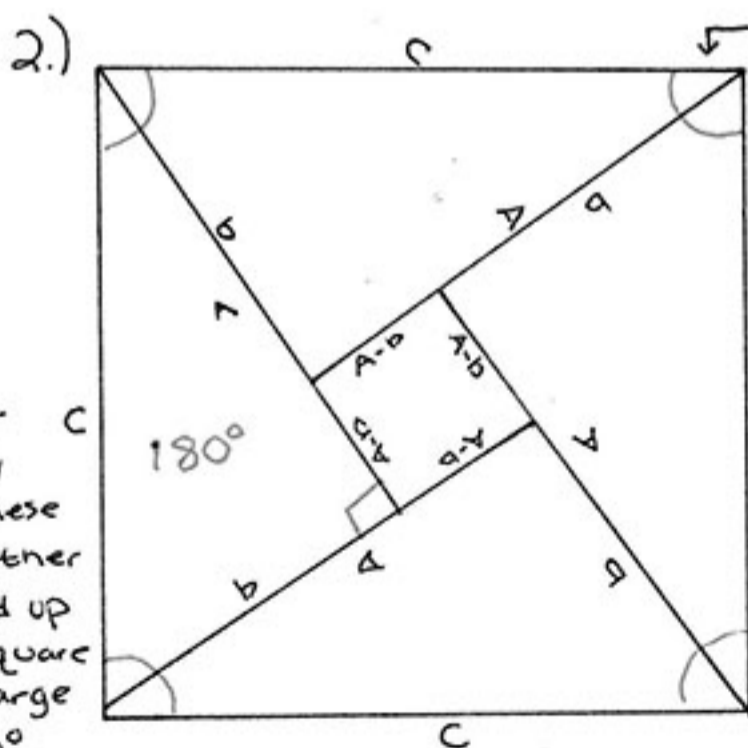
$A^2 + B^2 = C^2$



Once you find the dimensions of the small square you can prove that you have 2 perfect squares in the first diagram.

$A = (A-b) + b$
 $b = A - (A-b)$

Also, I can prove that the second diagram is a perfect square by the angles. The interior of a triangle is 180° and we already know we have a 90° angle because these are right triangles. Therefore the other 2 angles in the triangle must add up to 90° . In each corner of the square there are 2 triangle angles (one large and one big), which add up to 90° .



must add up to 90° because there is a small angle of the triangle and a larger angle, which we know both add to 90° because each triangle already has a 90° angle and the other 2 angles must add to 90° because the interior of a triangle is 180° .

Also, I can prove that the small square in the middle is truly a square because there is a 90° angle at the base which means that the interior corner is also 90° because a line is 180° .