
PROVING THE PYTHAGOREAN THEOREM

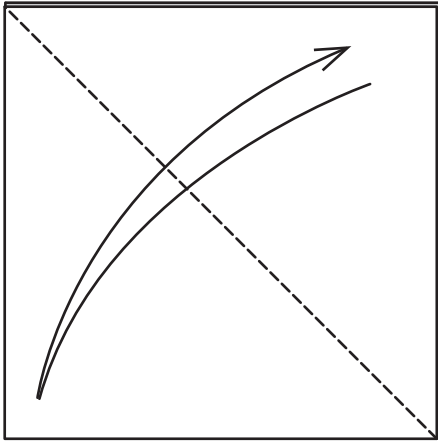
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Simple

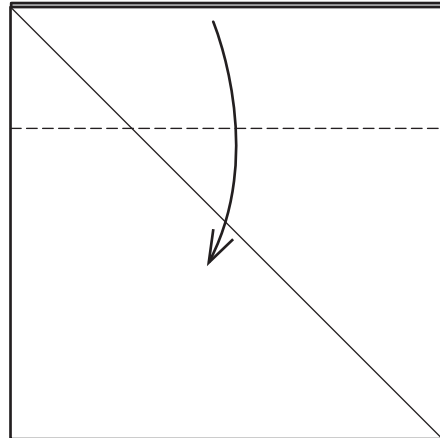
(Singapore)

2 squares of the same size, and colored, say, white on one side and grey on the other, are required.

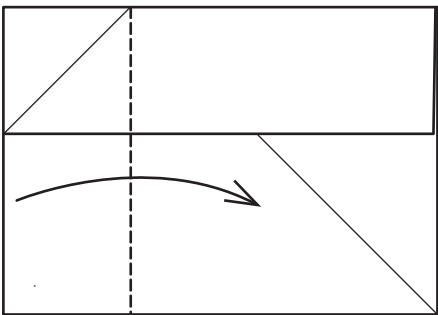
The proof is based on one which is attributed to Pythagoras himself.



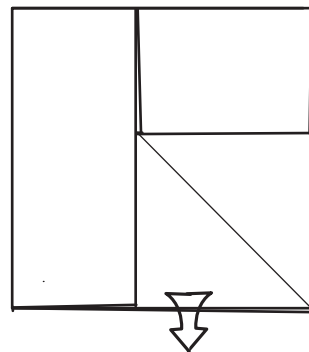
1. Place one square on top of the other. The bottom square has grey side on top and the top square has white side on top. Fold and unfold.



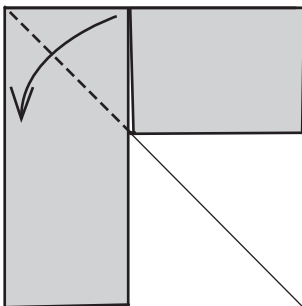
2. Fold down both squares an arbitrarily short distance.



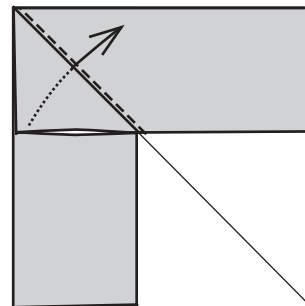
3. Fold.



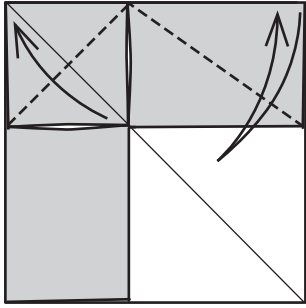
4. Detach the two papers by pulling down top layer.



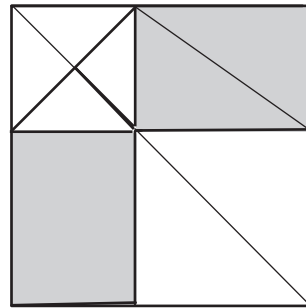
5. Take top piece. Fold.



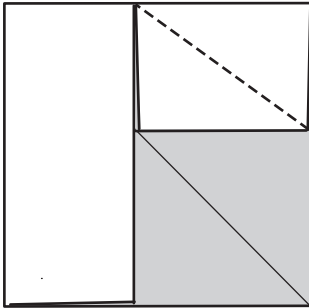
6. Fold out second and third layers.



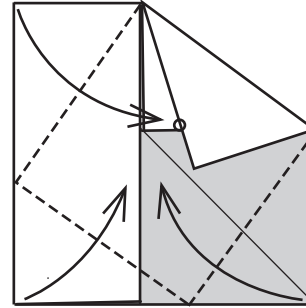
7. Fold up corner of paper and crease diagonal of top rectangle



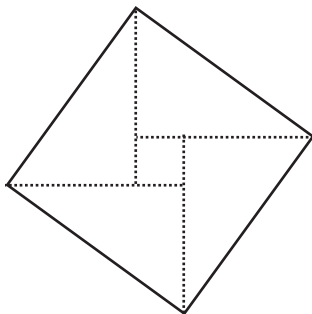
8. You now have 2 white squares adjacent to the perpendicular sides of a right-angled triangle. The areas of these 2 white squares are equal to the area of the large square minus the areas of the 2 grey rectangles.



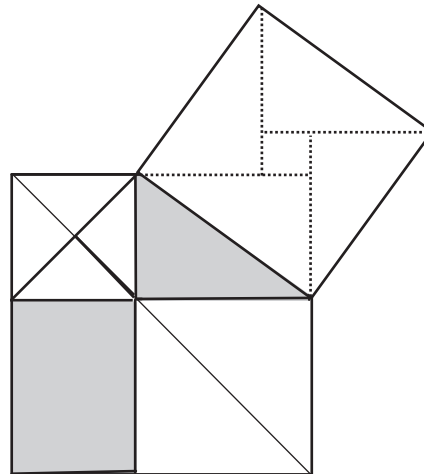
9. Now, take the other piece. Fold in top right-hand triangle along the diagonal of the rectangle. The white rectangle has the same area as a grey rectangle in Step 8. The triangle has half the area of the rectangle.



10. Fold in the top left-hand corner. Do likewise with the bottom left-hand corner and the bottom right-hand corner. The 4 right-angle triangles folded are similar and have the same area. Unfold the top right-hand and bottom left-hand corners and reverse fold. Unfold the top left-hand corner and sink fold. Turn over



11. Dotted lines mark the triangles folded in. The sides of the square have the same length as the hypotenuse of the triangle in Step 8. The area of this square is area of the big square in Step 8 minus the areas of 4 grey triangles or minus the areas of 2 grey rectangles. Slot the sink fold over the corner of the top grey rectangle of the other folded piece.



12. The Pythagorean Theorem solved.