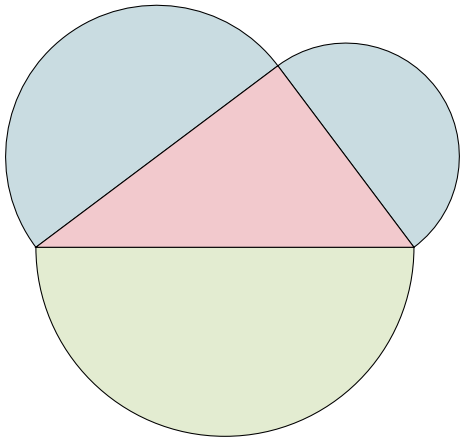
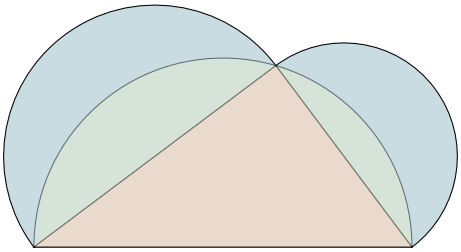
The Lunes of Alhaze (solution)

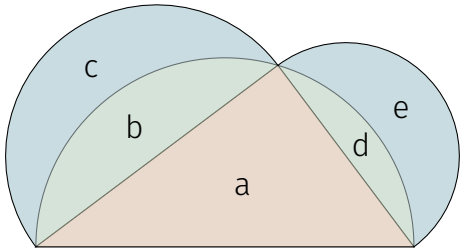


Since the triangle is rectangle, the Pythagorean theorem applies : the square of the length the hypotenuse is equal to the sum of the squares of the lengths of the two other sides.

But as a half circle's area is proportional to its diameter, this means that the blue area and the green one are equal.

Now consider the symmetrical of the green half disk with respect to the hypotenuse. Its area is the same so the equation still holds.





Naming all the regions, we can derive the following equation :

$$b + c + e + d = a + b + d$$

Hence, subtracting $b + d$ on both sides, we get

$$c + e = a$$

which proves that the blue lunes have the same area as the red triangle.