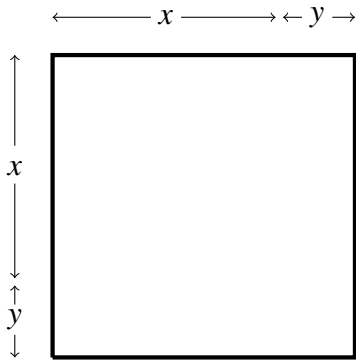


Problem A

1. Prove the algebraic identity $(x+y)^2 = (x-y)^2 + 4xy$ using a cut-and-paste argument. A picture of the left-hand side is drawn below. Thus, you must cut it into pieces such that the same area is calculated as the right-hand side.



2. Next you will solve the system of equations (below) in two different ways.

$$xy = 10 \quad (x+y)^2 + 4(x-y) = 45$$

- (a) Solve this using the Babylonian strategy on pages 69-70. This requires using part (1) above to rewrite the second equation as a quadratic in $(x-y)$ and then solving this quadratic using a Babylonian quadratic formula. Once this is accomplished, you solve the system of the form $x-y = a$, $xy = b$ again using the Babylonian quadratic equation.
- (b) Solve the system using a computational tool like Wolfram Alpha or similar. What do you observe?