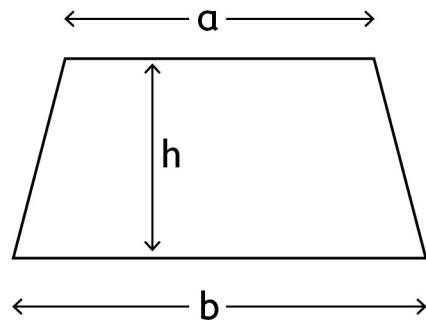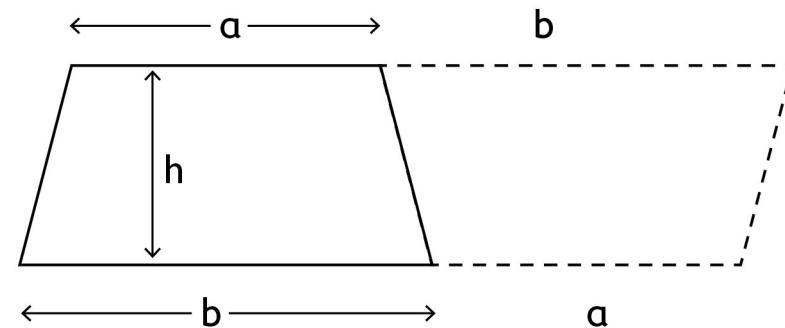# Trapezium

The diagram shows an **isosceles** trapezium.
The trapezium has height $h$ and parallel sides of length $a$ and $b$.

Poppy imagines a second copy of the trapezium. She rotates it to create the diagram here.
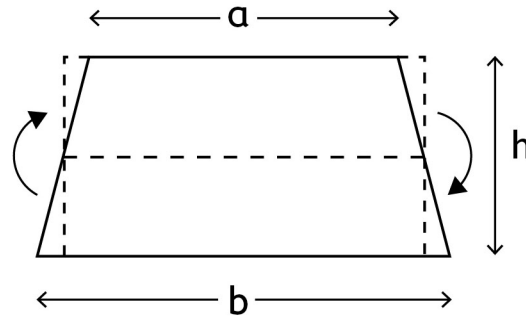
Poppy says,

"The area of a parallelogram is base times height, so the area of my diagram must be $(a + b) \times h$. The area of the trapezium is

$$A = \tfrac{1}{2}(a + b)h"$$

Ava thinks of a line drawn across the middle of the trapezium. She then imagines two small triangles being removed and replaced to create a rectangle as shown here.



Ava says,

"The horizontal line is the average of the lengths $a$ and $b$, so this length must be $(a + b) \div 2$.
The area of the trapezium is

$$A = \left(\frac{a+b}{2}\right) h\text{"}$$

**Question**

Show that Poppy's and Ava's formulae are equivalent.

**Extension Question**

Find other 'dissections' that could be applied to an isosceles trapezium and the formulae that describe them.