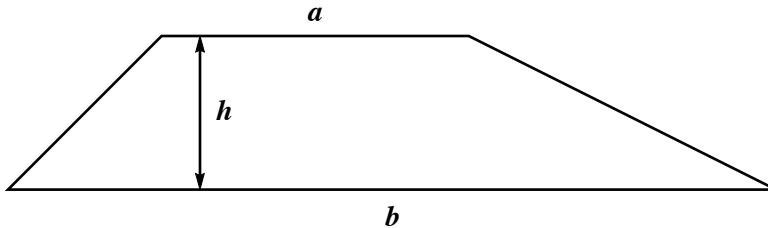


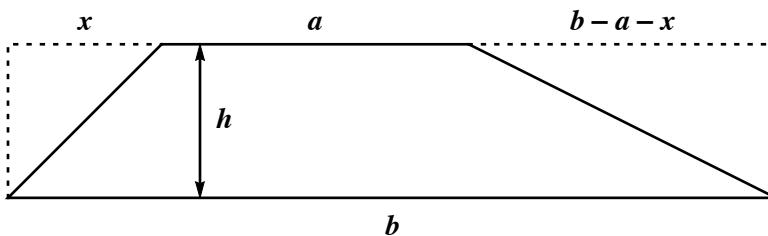
## The Area of a Trapezoid

A trapezoid is a quadrilateral (four-sided shape) with at least one pair of parallel sides. Here are some examples and how they relate to other quadrilaterals:

To find the area of a trapezoid, we start with the following diagram:



If we create a rectangle with side lengths  $b$  and  $h$  by adding in two triangles, we can find the area of the trapezoid by finding the area of the rectangle and then subtracting the area of the two triangles:



Using the above diagram, the area of any trapezoid is:

$$A = b \cdot h - \frac{1}{2}(x \cdot h) - \frac{1}{2}(b - a - x) \cdot h$$

$$A = b h - \frac{1}{2} x h - \frac{1}{2} b h + \frac{1}{2} a h + \frac{1}{2} x h$$

$$A = \frac{1}{2} b h + \frac{1}{2} a h$$

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