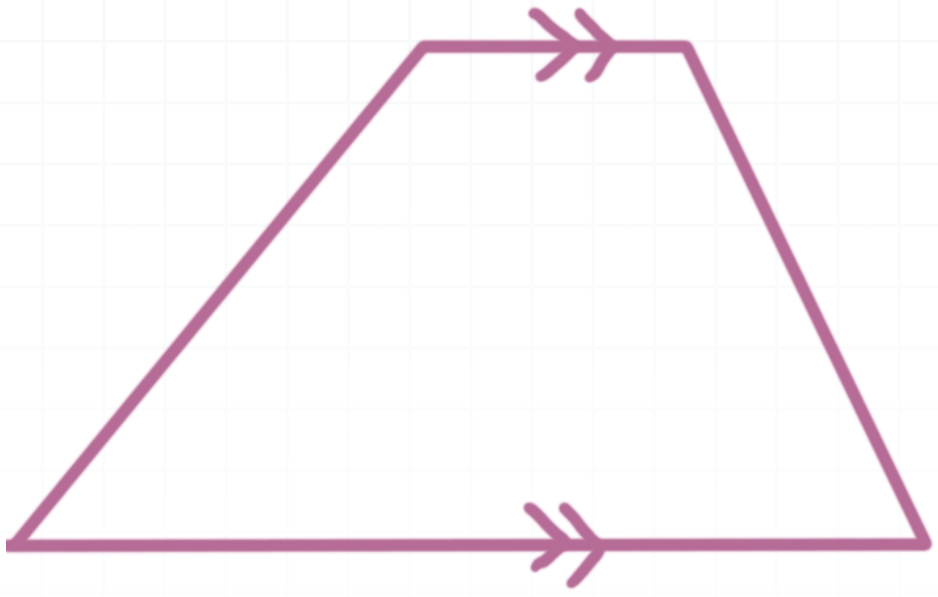
Area of a trapezoid

In this lesson we'll look at how to find the area of a trapezoid. A trapezoid is a quadrilateral with exactly one pair of opposite parallel sides.

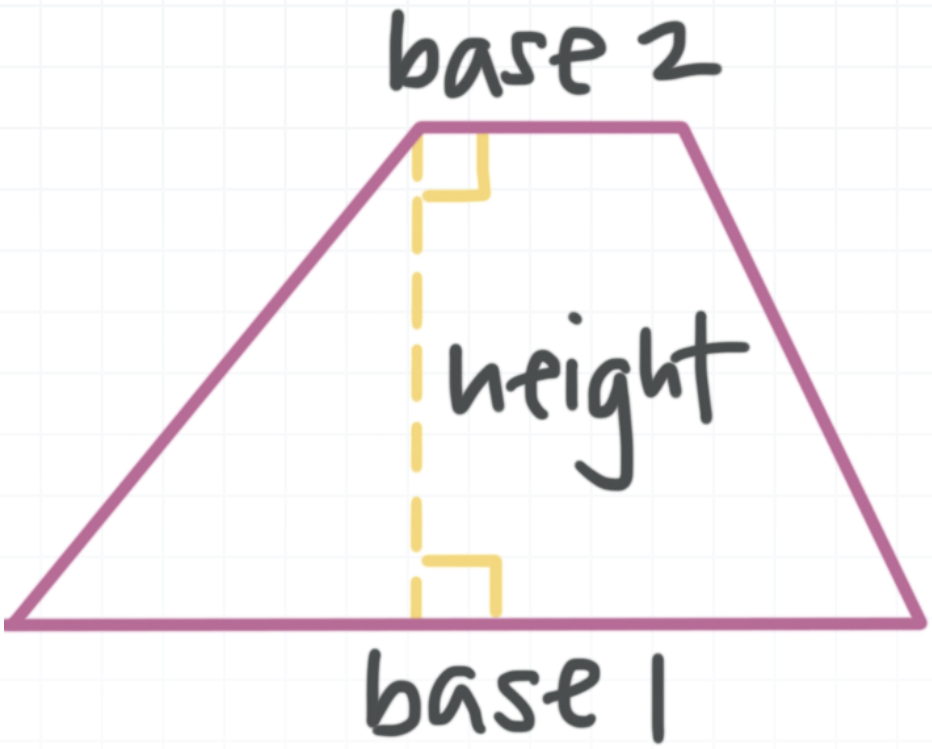


Area of a trapezoid

The area of a trapezoid is given by

$$A = \frac{1}{2}(b_1 + b_2)h$$

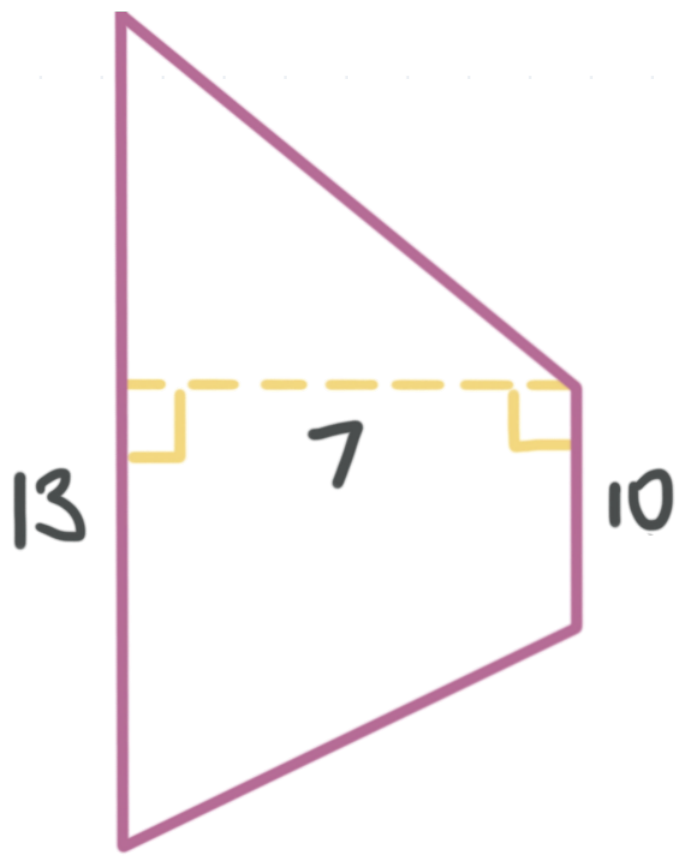
where b_1 and b_2 are the lengths of the parallel sides (which we call the **bases**), and h is the height of the trapezoid (which is perpendicular to both bases). Sometimes you'll need to draw in the height.



The area of a trapezoid is always given in units of length^2 ("length squared"). Let's start by working through an example.

Example

What is the area of the trapezoid?



The bases of a trapezoid are the parallel sides, so this trapezoid has bases of length 13 and 10.

The height of a trapezoid is the length of any line segment that has one endpoint on each base and is perpendicular to both bases, so this trapezoid has a height of 7.

$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(13 + 10)(7)$$

$$A = \frac{1}{2}(23)(7)$$

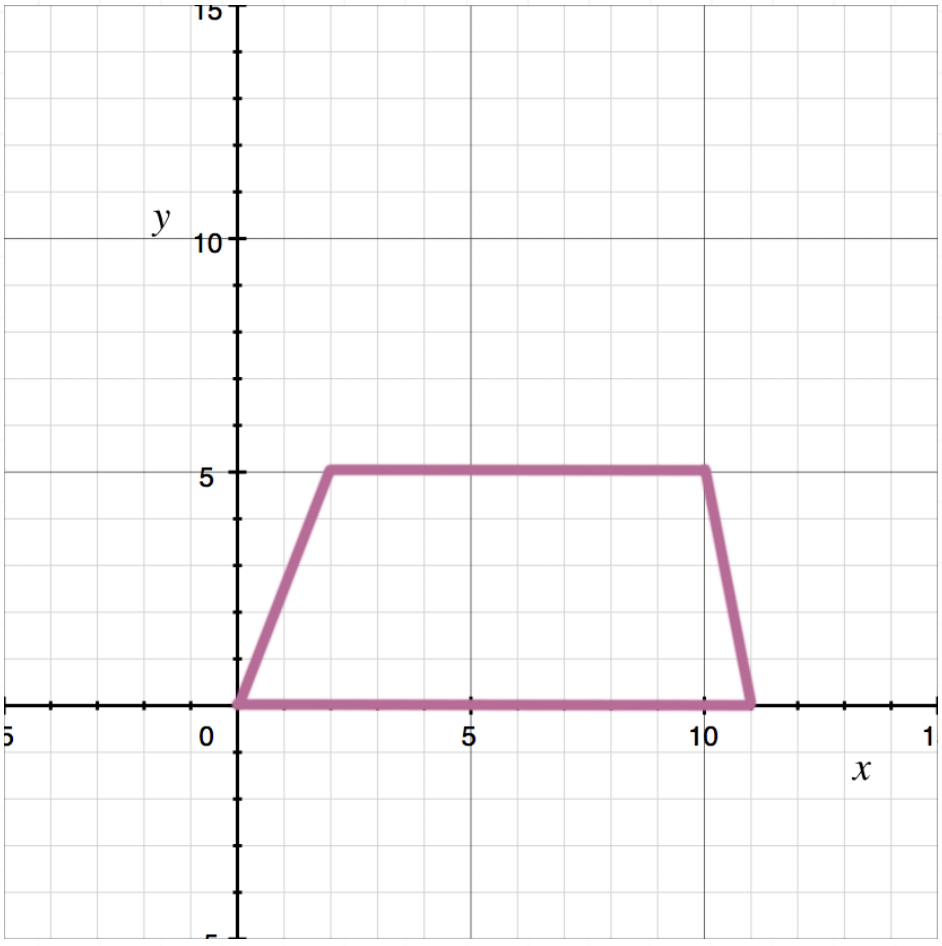
$$A = \frac{1}{2}(161)$$

$$A = 80.5$$

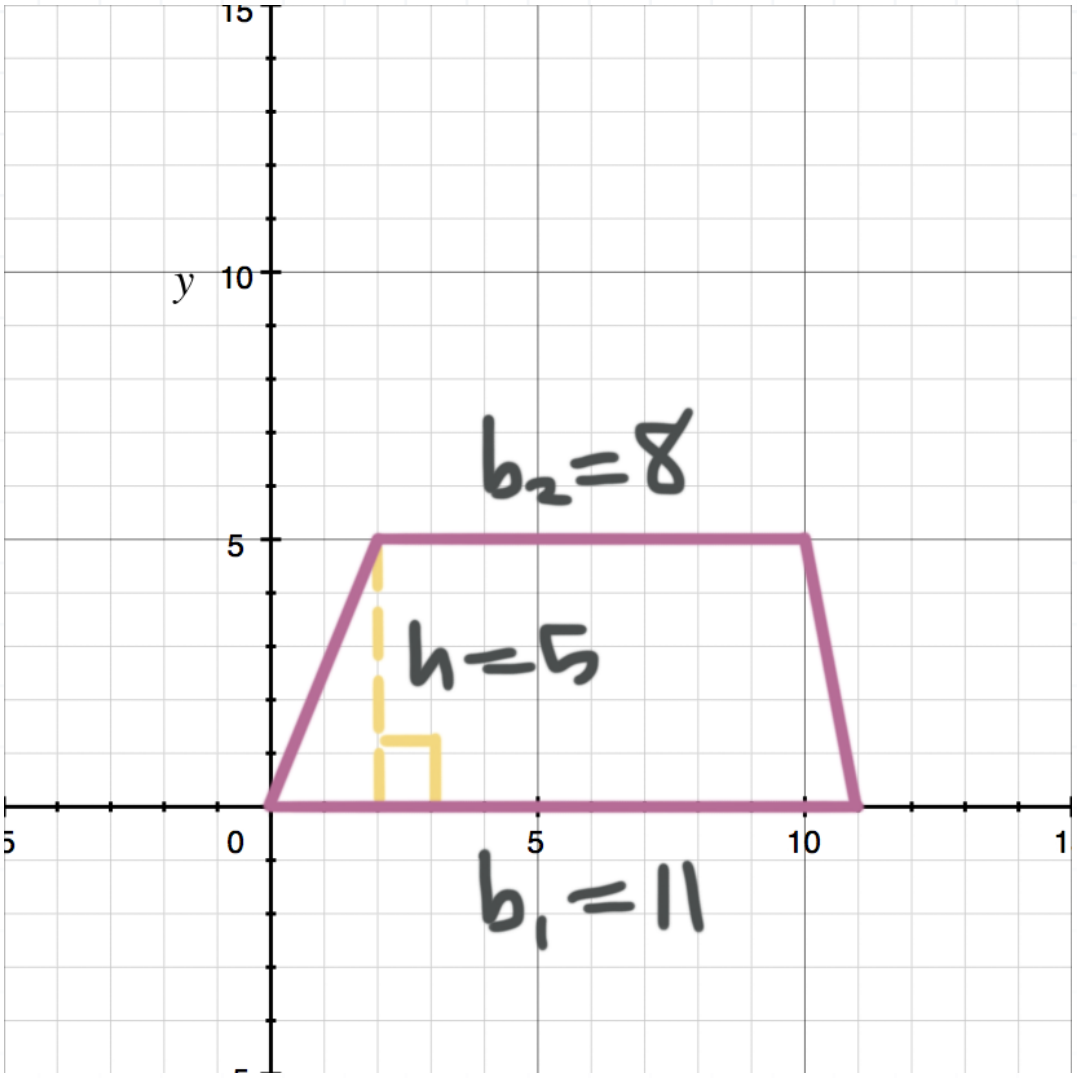
Let’s do one more example.

Example

What is the area of the trapezoid?



Use the grid (the system of horizontal and vertical lines) in the figure to find the dimensions of the trapezoid (the lengths of the bases and the height).



Now use the formula for the area of a trapezoid.

$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(11 + 8)(5)$$

$$A = 47.5$$