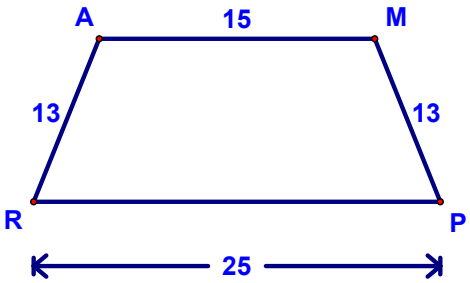
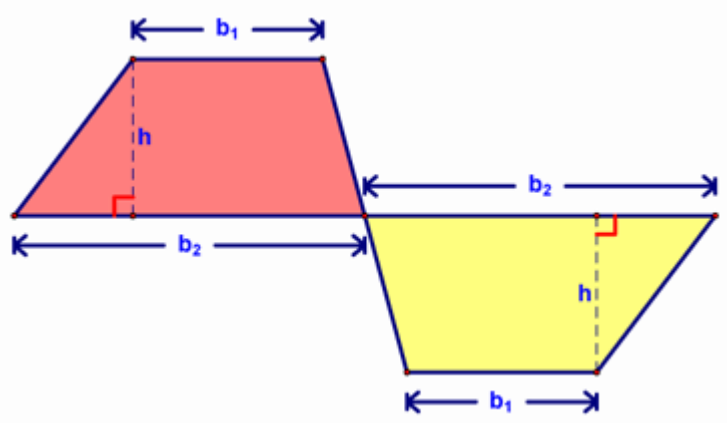
Area of a Trapezoid - Lesson 11-3

Warmup!

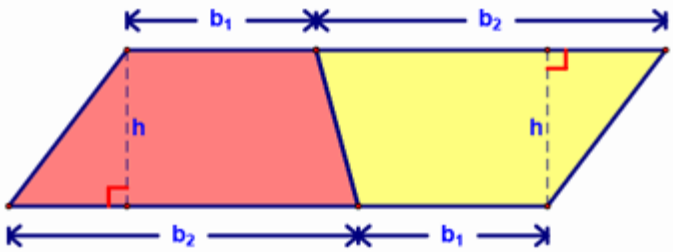
Find the area of AMPR



Today we're going to talk about the area of a trapezoid. To find this, let's start with a trapezoid (the red one), make a copy of it (the yellow one), and rotate it 180 degrees:

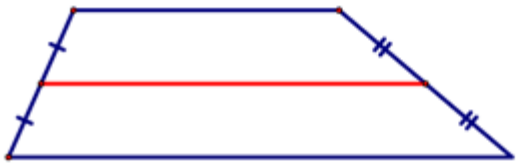


Next, let's translate it up to form a parallelogram (the combination of both trapezoids). Using the parallelogram area formula, we are able to find a formula for the area of the trapezoid:



Theorem 100: The area of a trapezoid is given by the formula $A=\frac{1}{2}(b_1+b_2)h$, where A is the area, b_1 and b_2 are the lengths of the two bases, and h is the height of the trapezoid (*Trapezoid Area Conjecture*).

Now, we're going to defined a *median of a trapezoid* and learn about two of its properties:



The *median of a trapezoid* is the line segment that joins the midpoints of the non-parallel sides of a trapezoid.

Theorem 101: The measure of the median of a trapezoid equals the average of the measures of the bases.

$$\text{Length}_{\text{Median}} = \frac{1}{2}(b_1 + b_2)$$

where b_1 is the length of one base and b_2 is the length of the other base.

Theorem 102: The area of a trapezoid is given by the formula

$$A_{Trap} = Mh$$

where M is the length of the median and h is the height of the trapezoid.