

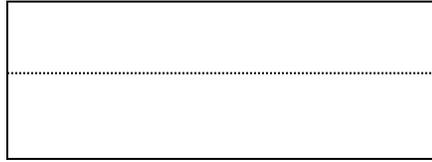
# 11.3 - Area of a trapezoid

Discover the formulas on your own!

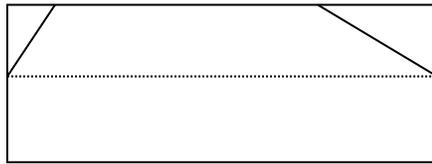


Follow the steps below. Answer the questions as you go along.

1) Fold the rectangle (index card) in half as pictured below to make a crease. Then unfold the rectangle.

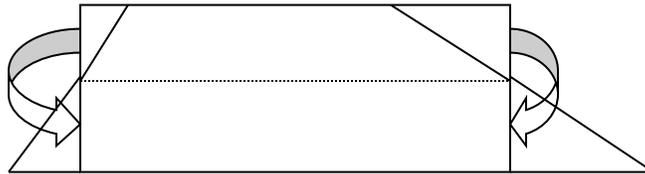


2) Draw two points at the top of the rectangle. Connect each point to the closest endpoint of the fold (NOT THE BOTTOM OF THE RECTANGLE)



3) Cut off the two small triangles at the top of the rectangle.

4) Rotate the triangles 180° about the endpoints of the crease to create a trapezoid.



- How does the sum of the bases of the rectangle relate to the sum of the bases of the trapezoid?
- How does the area of the rectangle relate to the area of the trapezoid?
- How can you find the median of the trapezoid?  
*The crease is called the MEDIAN because it is the line segment joining the midpoints of the nonparallel sides.*
- What is the formula for area of a trapezoid?

Ex 1:

Given that the height of a trapezoid is 12. The bases are 6 and 14. Find:

a) the median  $\frac{16+4}{2} = \boxed{10}$

b) the area of the trapezoid  $A = m \cdot h$   
 $A = 10 \cdot 12$   
 $A = \boxed{120}$

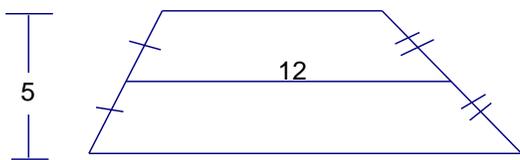
Ex 3:

The area of a trapezoid is 300 square units and its height is 10. The lower base is twice as long as the upper base. How long is each base?

$\boxed{20 \text{ and } 40}$

$$300 = \frac{2x + x}{2} \cdot 10$$
$$600 = 10(2x + x)$$
$$60 = 3x$$
$$20 = x$$

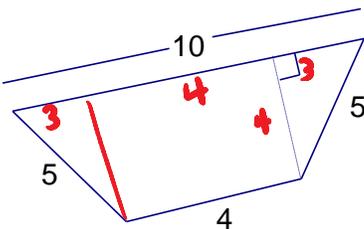
Ex 5:



$\boxed{60}$

Ex 7:

Find the area



$$A = \frac{10+4}{2} \cdot 4$$

$$A = 7 \cdot 4$$

$\boxed{A = 28}$

Ex 2:

Find the shorter base of a trapezoid if the trapezoid's area is 52, its altitude is 8, and its longer base is 10

$$A = \frac{b_1 + b_2}{2} \cdot h$$

$$52 = \frac{x + 10}{2} \cdot 8$$

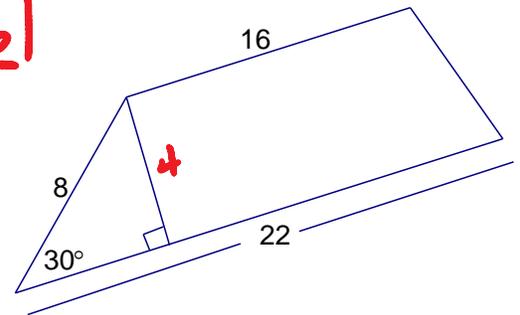
$$104 = 8(x + 10)$$

$$13 = x + 10$$

$\boxed{3 = x}$

Ex. 4:

$\boxed{A = 76}$



Ex 6:

Given that the height of a trapezoid is 4 and the Area is 28, find the median:

$$A = m \cdot h$$

$$28 = m \cdot 4$$

$\boxed{m = 7}$

Ex 8:

Find the area

