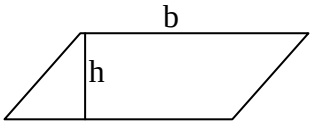
Math 1312
Section 8.1 - 8.2
Perimeter and Area of Polygons

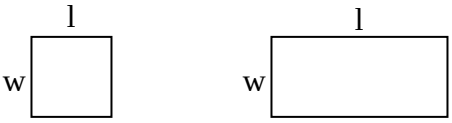
Area and Perimeter formulas

l = length	w = width
P = perimeter	b = base
h = height	d = diagonal
r = radius	m = median
a = apothem	

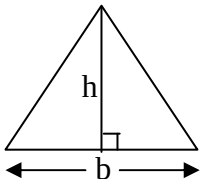
1. Parallelogram: $A = bh$



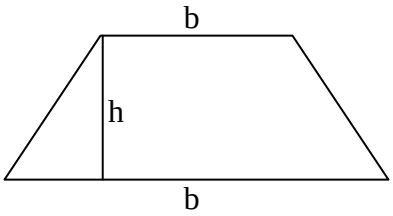
2. Rectangle/square: $A = lw$

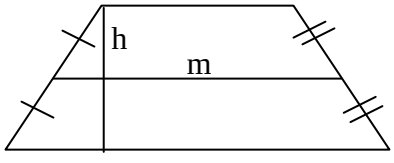


3. Triangle: $A = \frac{1}{2}bh$

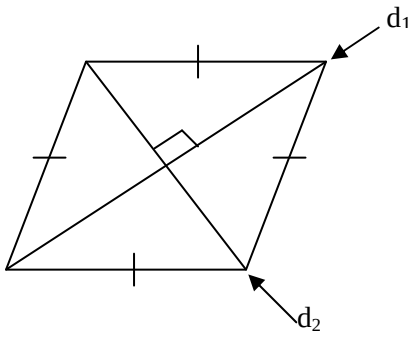


4. Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$ OR $A = mh$





5. Rhombus and kite: $A = \frac{1}{2} d_1 d_2$



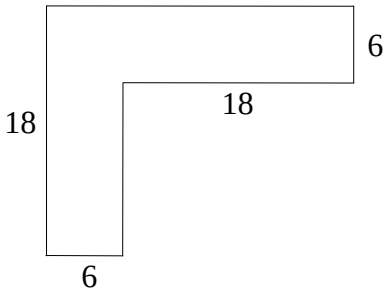
Heron's Formula: For any triangle with sides of lengths a, b and c, the area is found by $A = \sqrt{s(s-a)(s-b)(s-c)}$ where s is the *semi*perimeter of ΔABC ($s = \frac{1}{2}(a+b+c)$)

Brahmagupta's Formula: For a quadrilateral with sides a, b, c, and d the area is $A = \sqrt{(s-a)(s-b)(s-c)(s-d)}$ ($s = \frac{1}{2}(a+b+c+d)$)

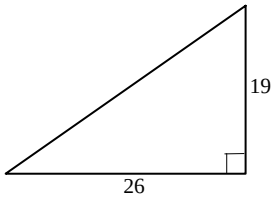
Theorem: The ratio of the areas of two similar triangles (or any similar polygons) equals the squares of the ratios of the lengths of any two corresponding sides.

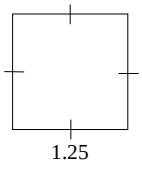
$$\frac{A_1}{A_2} = \left(\frac{s_1}{s_2}\right)^2$$

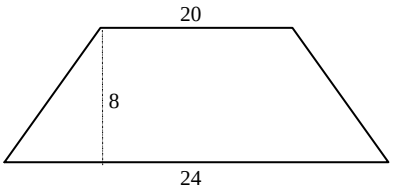
Example 1: What is the total area of the figure below:

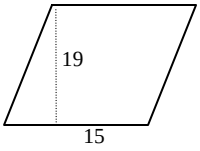


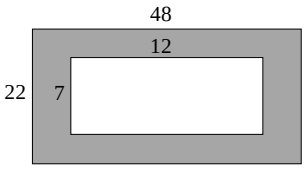
Example 2: Find the area of each figure below:











Example 3: The area of a triangle is 216 square-units. If the height is 18 units, what is the length of the base?

Example 4: The diagonals of a rhombus are 21 and 16 centimeters long. Find the area of the rhombus.

Example 5: Compare the areas of two similar triangles in which each side of the first triangle 3 times as long as each side of the second.

Example 6: Find the area of a triangle with sides 4, 13, 15.