# Session #2: Rectangles, Parallelograms, Triangles & Trapezoids

Today we will explore properties of several different 2D shapes like rectangles, trapezoids, squares, parallelograms and finish with a special Math Challenge!

A **QUADRILATERAL** is a closed 2D shape with

_____straight sides and _____vertices.

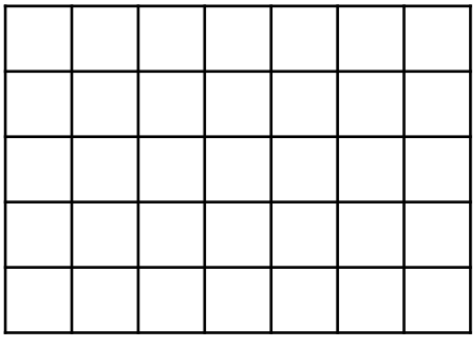
The sum of all angles in a quadrilateral is_____

A RECTANGLE is a quadrilateral with

_____right angles (90°) and opposite sides that are parallel and equal.

Area is the how much flat space a shape takes up. For a **RECTANGLE** the area is length x width.

$$A = L \times W$$

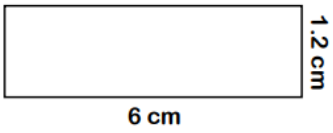


**Length:**

**Width:**

**Area:**

Find the area:

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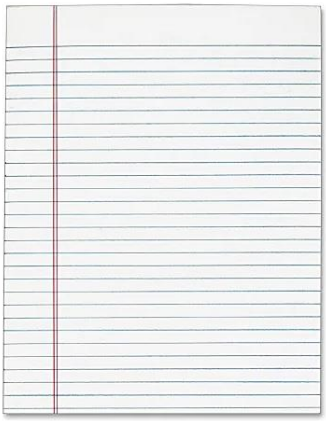
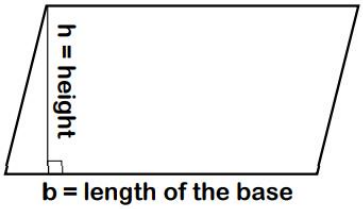


A **PARALLELOGRAM** has two pairs of parallel sides that are equal.

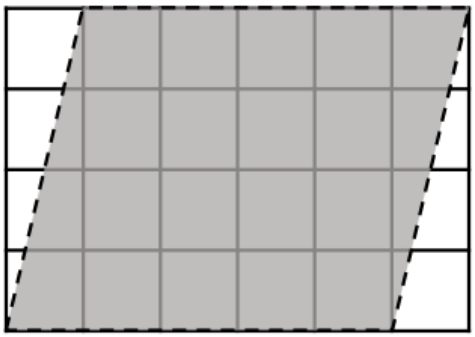



**Area for a parallelogram is the height times the length of the base.**

**Make sure the height makes a 90° angle with the base.**

**Area = b x h**

Find the area of this shape:

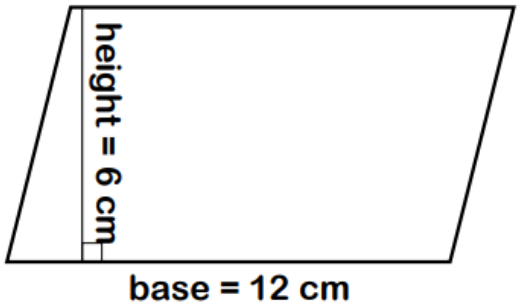


**Base:**

**Height:**

**Area:**

Find the area of this shape:




**Base:**

**Height:**

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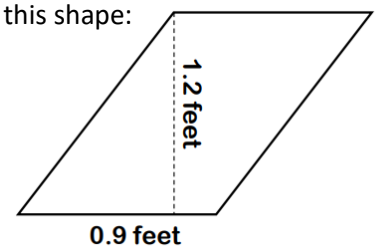
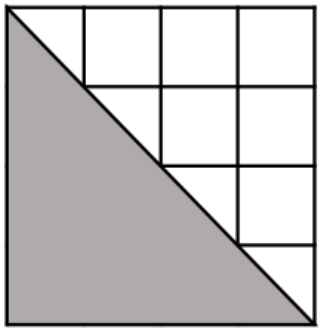
Find the area of this shape:



**TRIANGLES** are polygons with 3 vertices and 3 sides.

The sum of all angles in a triangle is_____

Think of the area of a triangle as *half* of the area of a rectangle.



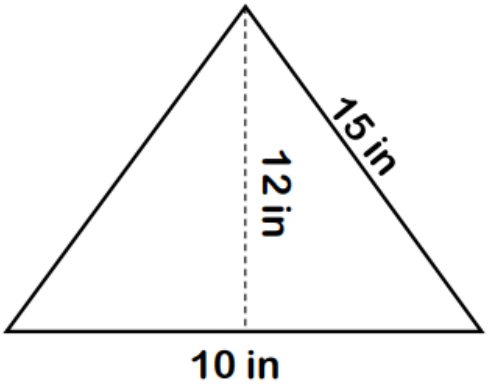
**Area = ½ b x h**

**Base:**

**Height:**

**Area:**

Find the area of this shape:

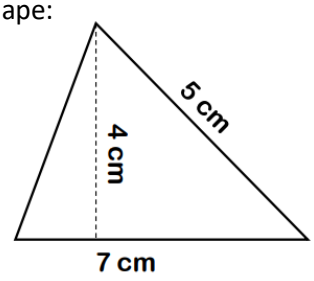



**Base:**

**Height:**

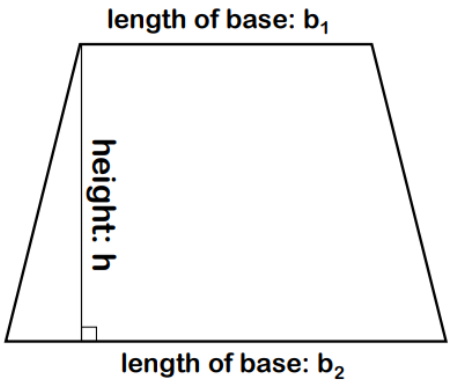
**Area:**

Find the area of this shape:



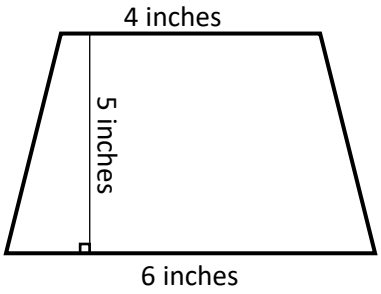
A **TRAPEZOID** is a quadrilateral with only *one pair* of parallel sides.

The parallel sides are *bases*
and the non-parallel sides are *legs.*

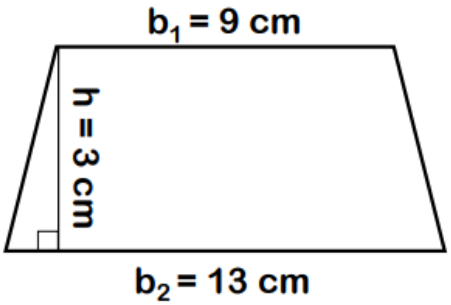



**Trapezoid Area = ½ ($b_1$ + $b_2$) h**

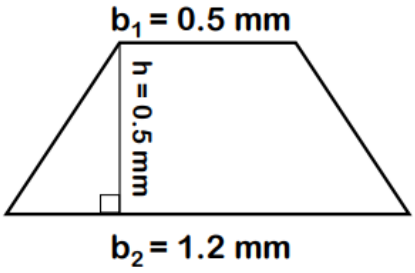
Find the area of this shape:




Find the area of this shape:




Find the area of this shape:



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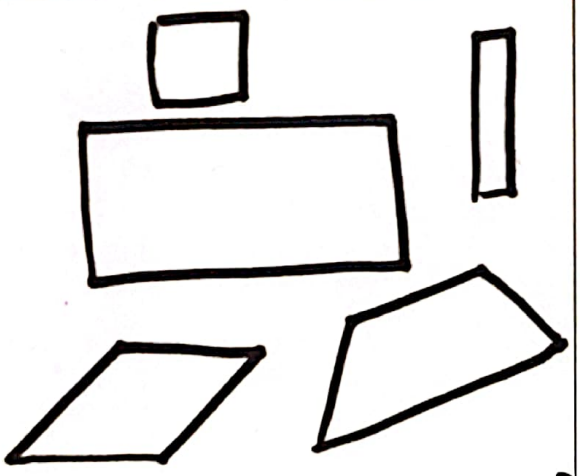
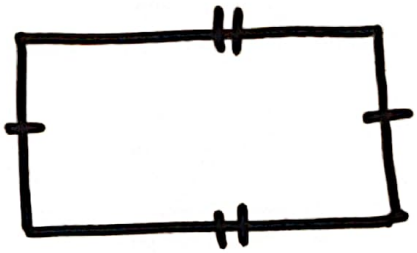
4 straight sides and 4 vertices.



The sum of all angles in a quadrilateral is 360°

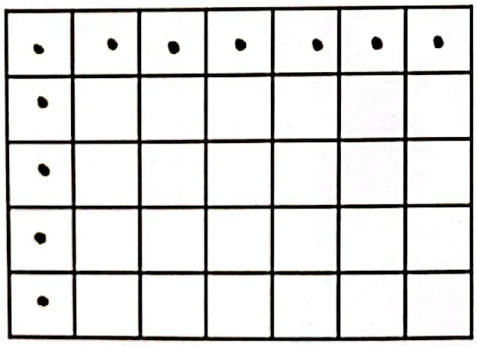
A RECTANGLE is a quadrilateral with

4 right angles (90°) and opposite sides that are parallel and equal.



Area is the how much flat space a shape takes up. For a **RECTANGLE** the area is length x width.

$$A = L \times W$$

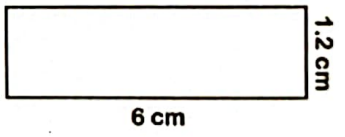


Length: 7 units

Width: 5 units

Area: $A = 7 \times 5 = 35$ units$^2$

Find the area:




$A = L \times W$

$A = (6\text{ cm}) \times (1.2\text{ cm})$

$A = 7.2\text{ cm}^2$

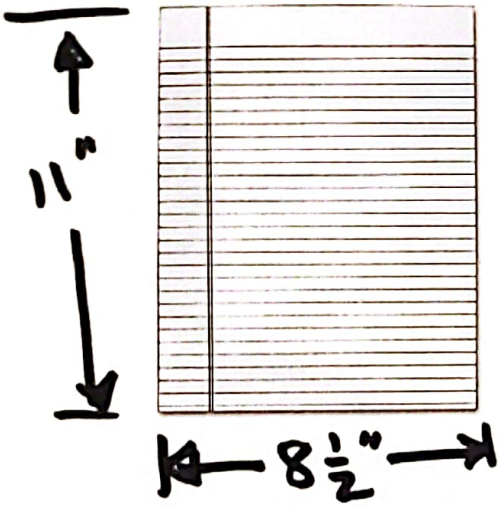

2.6"

6.1"

$A = L \times W$

$A = (6.1")(2.6")$

$A = 15.86\ in^2$



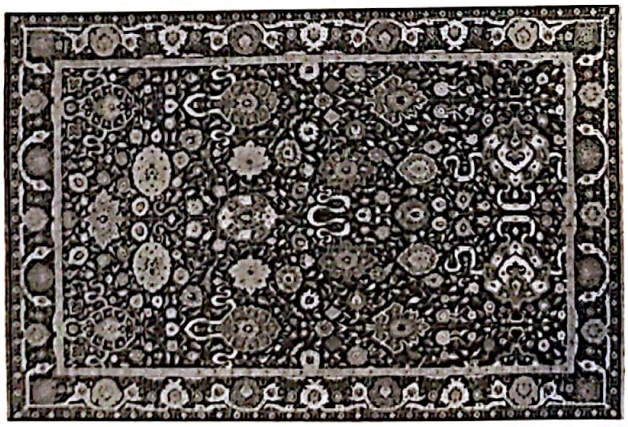
11"

$8\frac{1}{2}"$

$A = L \times W$

$A = (8.5")(11")$

$A = 93.5\ in^2$



$A \sim 200\ ft^2$

one side = 12 ft

$A = L \times W$

$200\ ft^2 = L \times 12\ ft$

Divide by 12ft → $\frac{200\ ft^2}{12\ f} = L \times \frac{12\ ft}{12\ ft}$

$L = 16.67\ ft \sim 17'$

**Rug = 12' x 17'**

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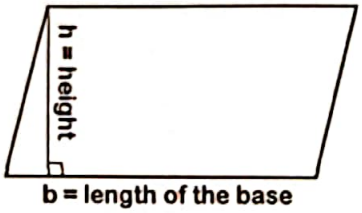
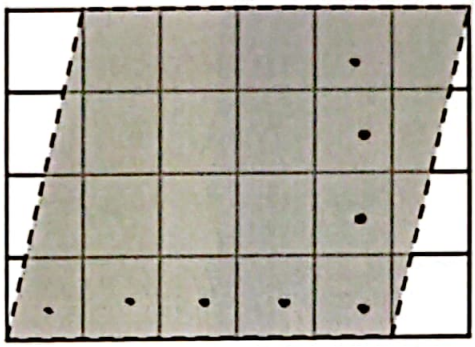



**Area for a parallelogram is the height times the length of the base.**

**Make sure the height makes a 90° angle with the base.**

**Area = b x h**

Find the area of this shape:

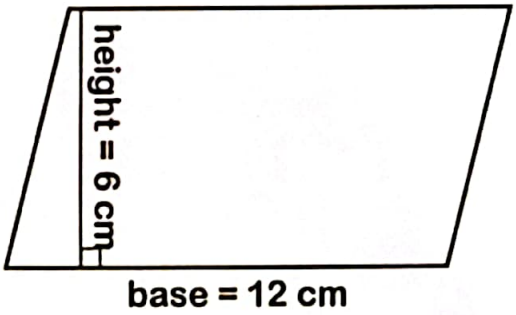


Base: 5 units

Height: 4 units

Area: $A = 5 \cdot 4 = 20 \text{ units}^2$

Find the area of this shape:



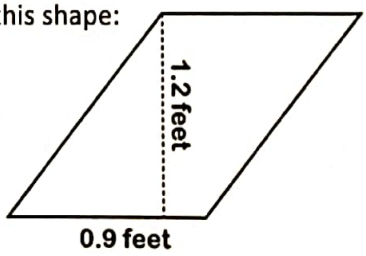

Base: 12 cm

Height: 6 cm

Area: $b \times h = (12)(6)$

$A = 72 \text{ cm}^2$

Find the area of this shape:




$A = b \times h$

$A = (0.9 \text{ ft})(1.2 \text{ ft})$

$A = 1.08 \text{ ft}^2$

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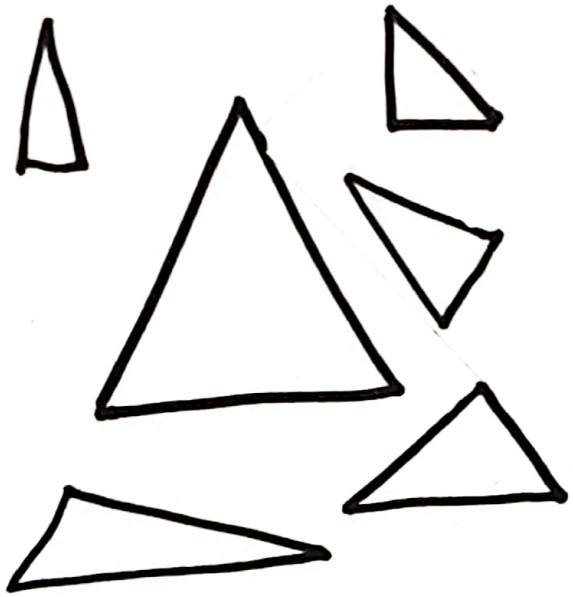
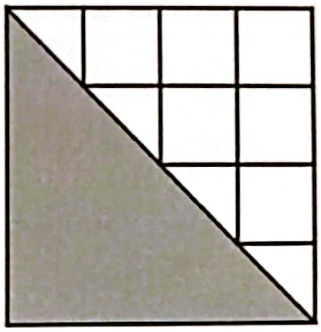


The sum of all angles in a triangle is 360°

Think of the area of a triangle as *half* of the area of a rectangle.



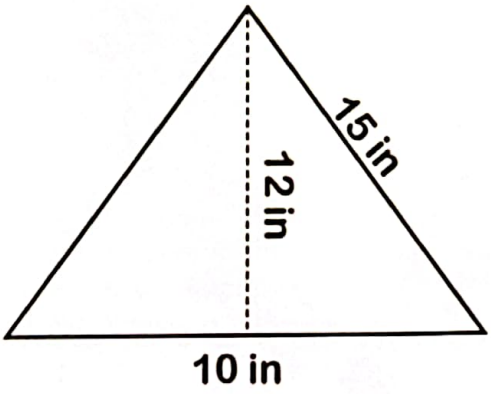
Area = ½ b x h

Base: 4 units

Height: 4 units

Area: $\frac{1}{2}(4)(4) = 8 \text{ units}^2$

Find the area of this shape:



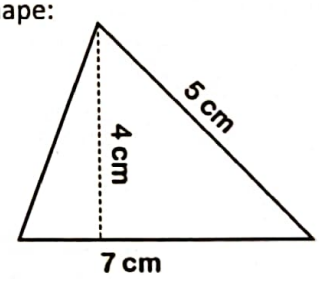

Base: 10 in

Height: 12 in

Area: $\frac{1}{2}(10\text{in})(12\text{in})$

$A = 60 \text{ in}^2$

Find the area of this shape:




$A = \frac{1}{2} b \cdot h$

$A = \frac{1}{2}(7\text{cm})(4\text{cm})$

$A = 14 \text{ cm}^2$

A **TRAPEZOID** is a quadrilateral with only *one pair* of parallel sides.

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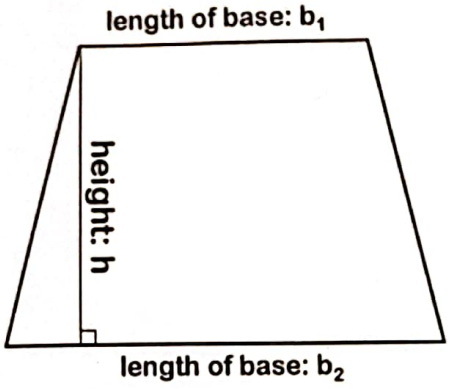
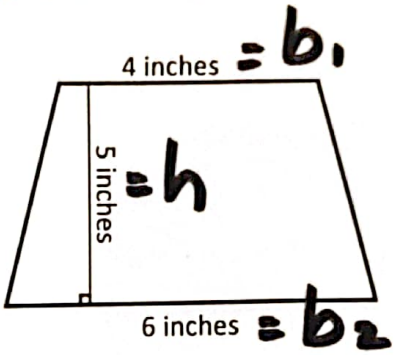



**Trapezoid Area = ½ ($b_1$ + $b_2$) h**

Find the area of this shape:

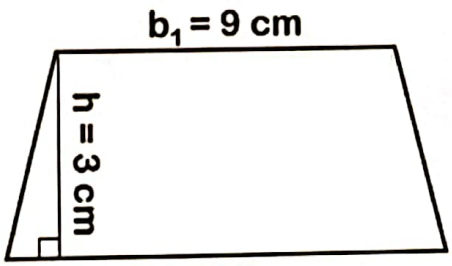



$A = \frac{1}{2}(4" + 6")5"$

$A = \frac{1}{2}(10")5"$

$A = 25\ in^2$

Find the area of this shape:

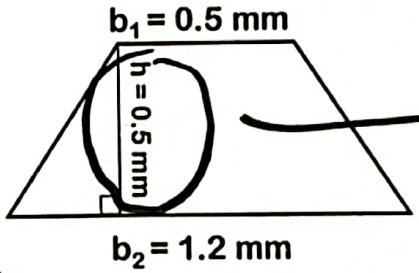



$A = \frac{1}{2}(9cm + 13cm)(3cm)$

$A = \frac{1}{2}(22cm)(3cm)$

$A = 33\ cm^2$

Find the area of this shape:




$A = \frac{1}{2}(0.5 + 1.2)(0.5)$

$A = \frac{1}{2}(1.7mm)(0.5mm)$

$A = 0.425\ mm^2$