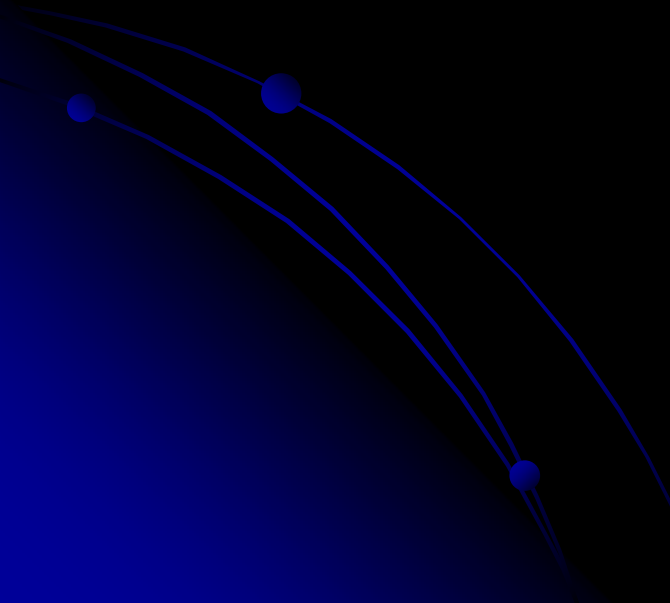
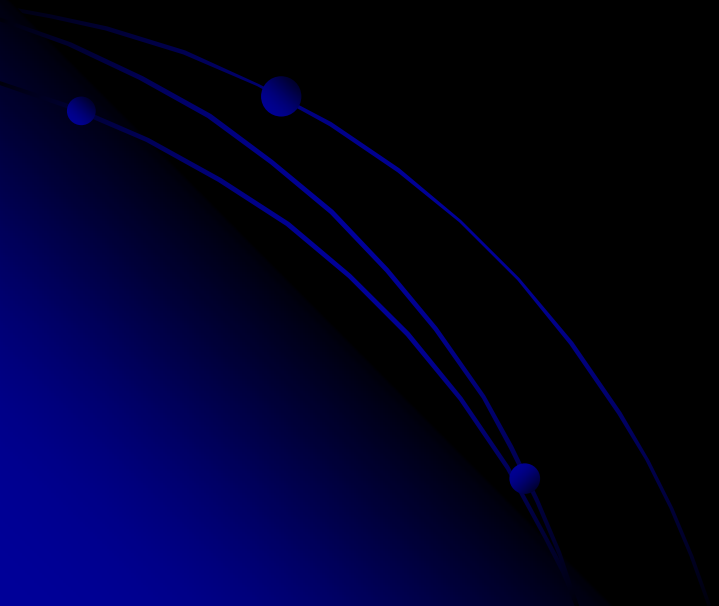


# Cesar Chavez Academy

Geometry  
(Parallelograms)  
By  
Aldo Hernandez

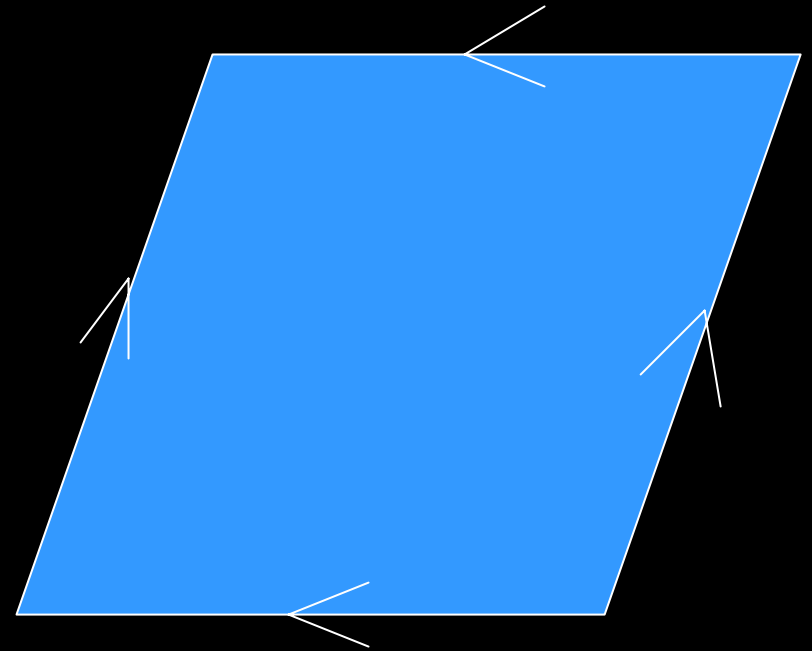


# Parallelograms



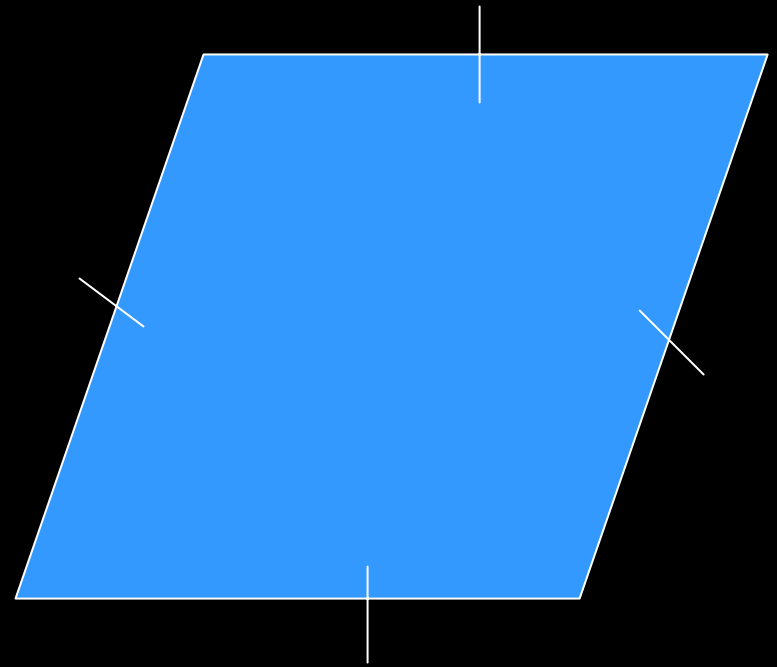
# Definition of a Parallelogram

- A parallelogram is a quadrilateral that has two pairs of parallel sides.



# Properties of Parallelograms

- 1. The opposite sides are equal in length.



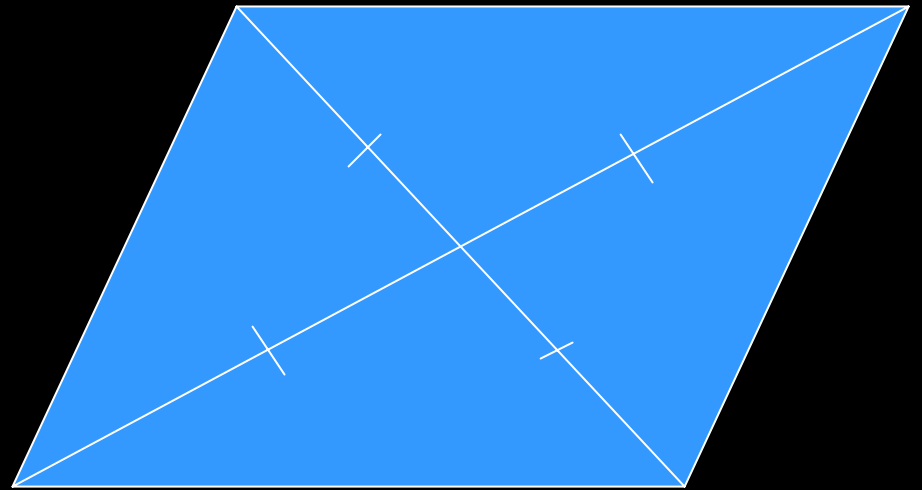
# Properties of Parallelograms

- 2. The opposite angles are congruent.



# Properties of Parallelograms

- 3. The diagonals bisect each other.



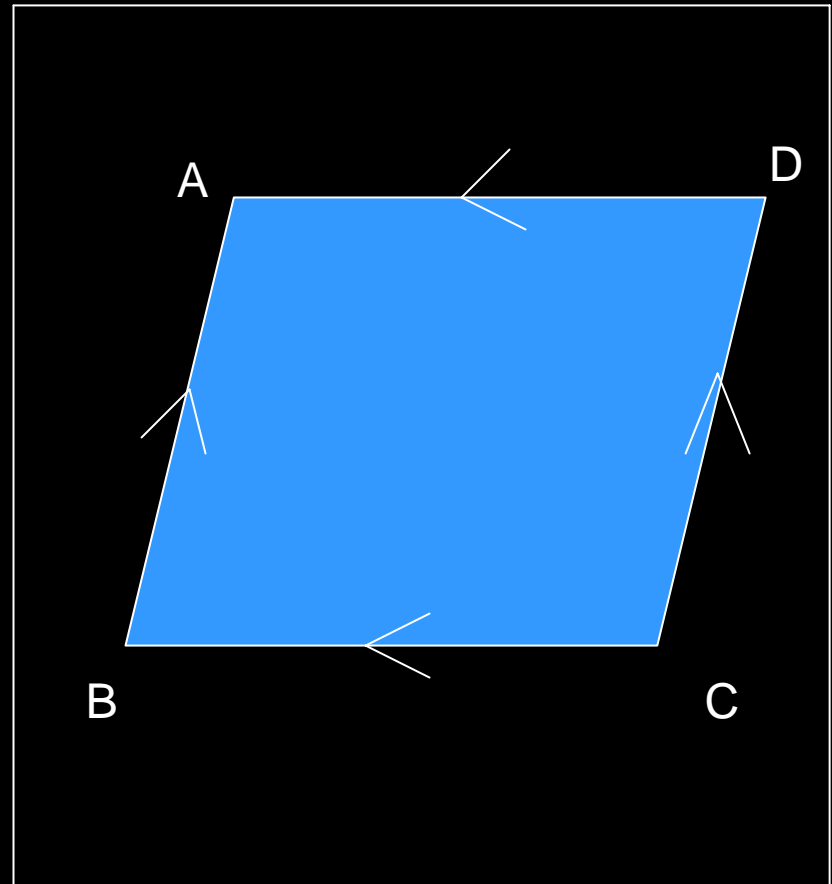
# Conditions to be a Parallelogram

If the quadrilateral has one of the  
Following conditions, then it is a  
parallelogram



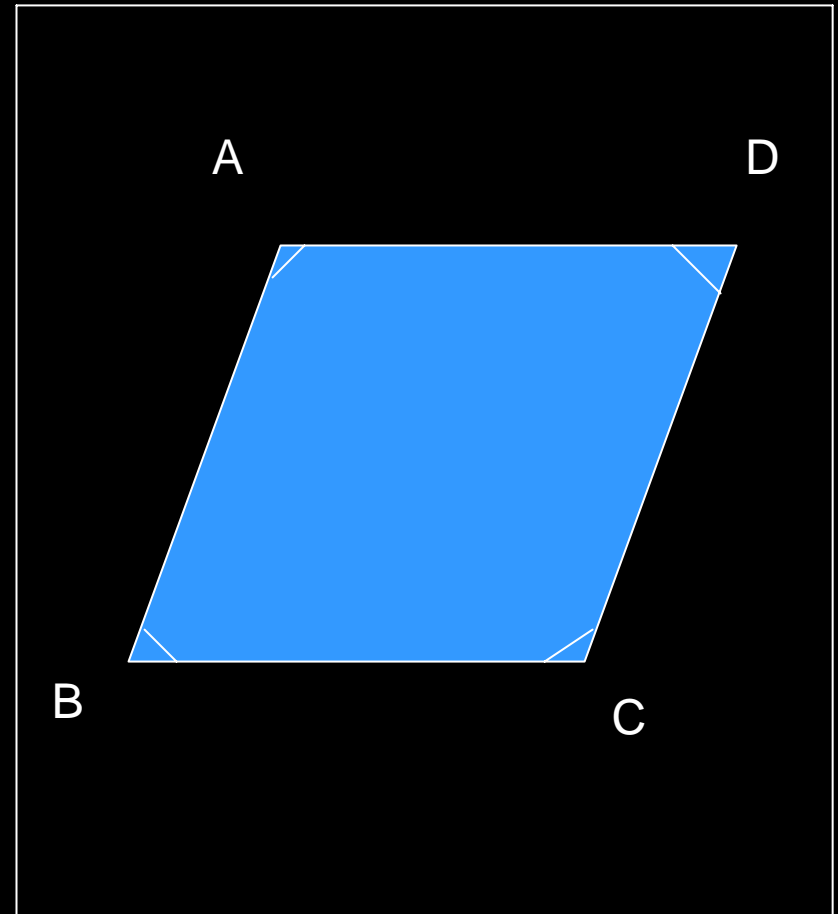
# Conditions to be a parallelogram

- 1. If a quadrilateral has two pairs of parallel sides, then it is a parallelogram

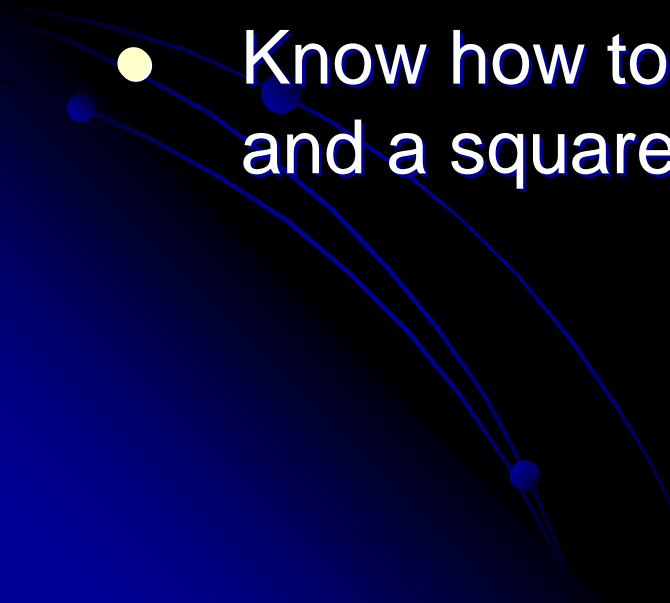


# Conditions to be a Parallelogram

- 2. If two pairs of opposite angles of a quadrilateral are the same, then the figure is a parallelogram.

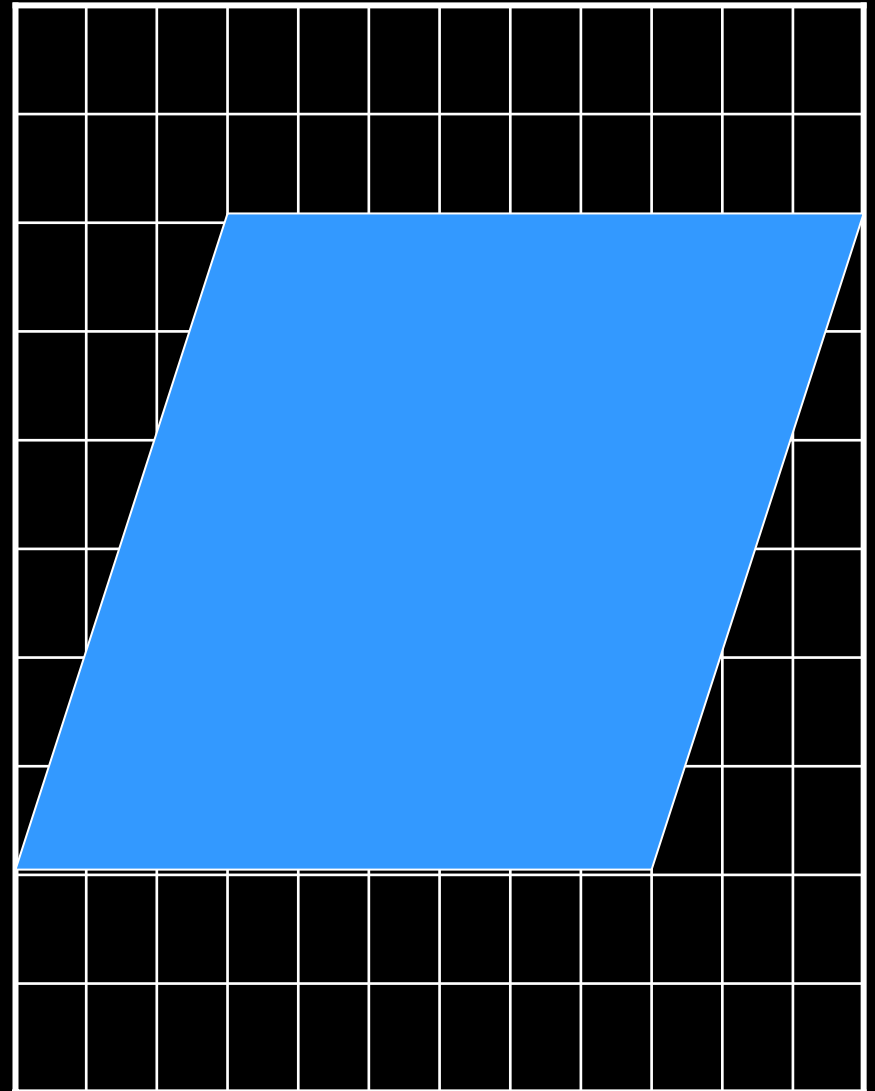


# The Area of a Parallelogram

- Prerequisites
  - Students should:
    - Be familiar with “area.”
    - Be able to define and identify a parallelogram.
    - Know how to calculate the area of a rectangle and a square.
- 

# Our goal is to determine what the area of the parallelogram below is.

- The first thing that you need to do is to see the dimensions of our shape.



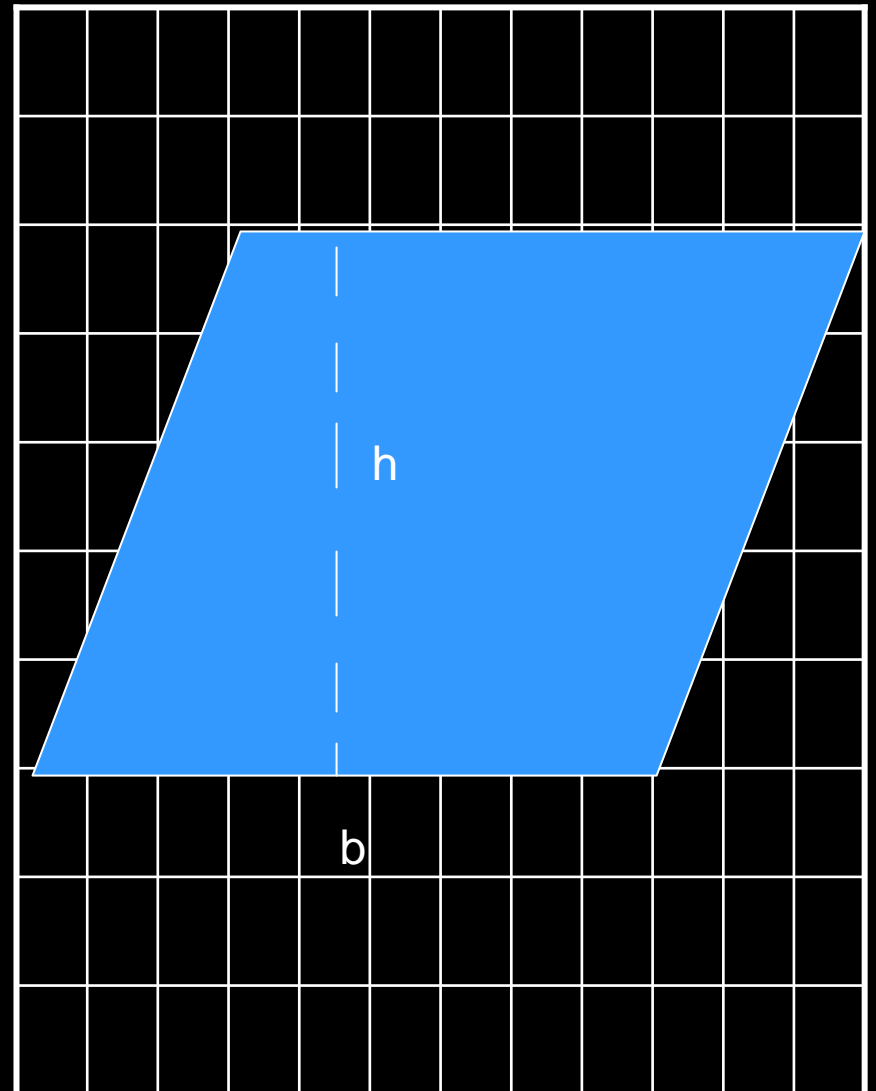
The second thing that you need to do is cut out the parallelogram in the diagram below.

Also, cut along the dotted line so that you have two trapezoids.



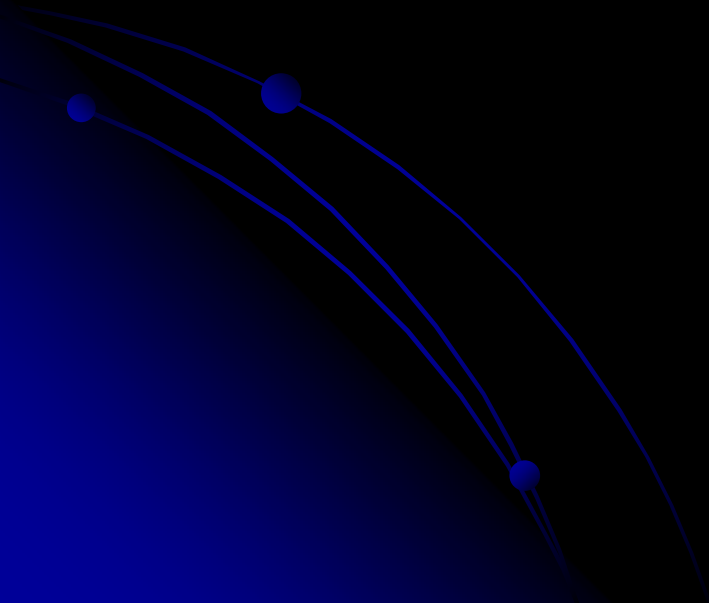
# Try to Rearrange the two Trapezoids

- So that they form a figure for which we already have a way to determine its area




# Solution:

- We could count the grid squares inside the parallelogram to determine the area, but we need a general way to find the area for all parallelograms.

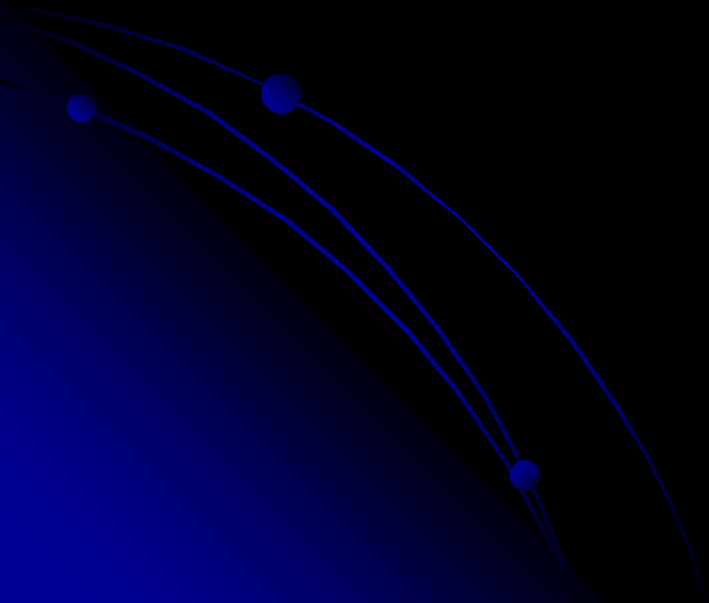


2. Students should cut out Diagram #2 on their handout, also cutting it into two trapezoids on the dotted line.

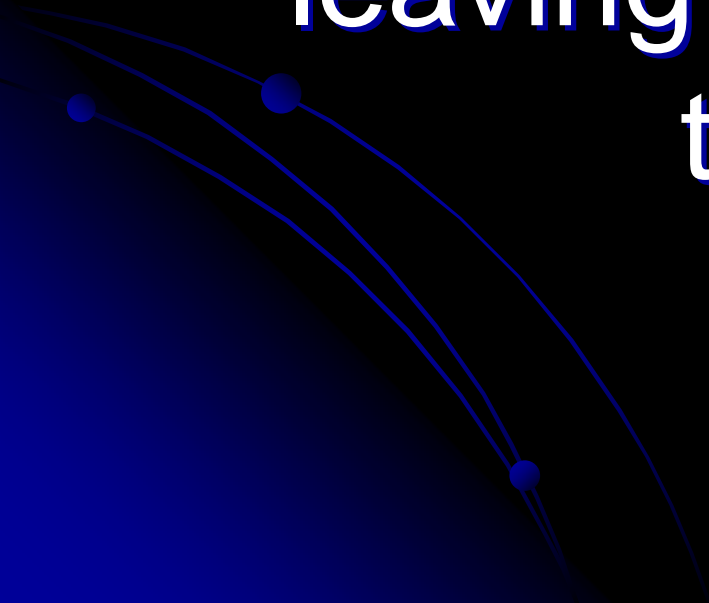


# Hands\_on Question

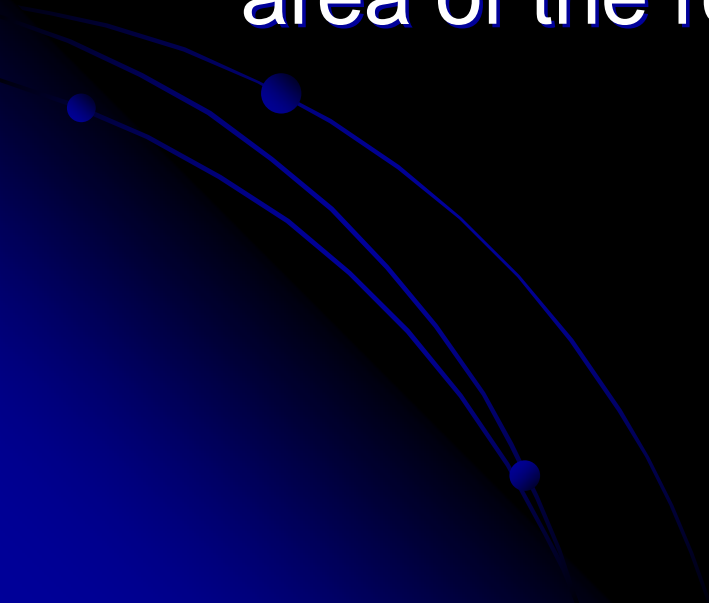
3.If any student can rearrange his or her trapezoids to form a figure for which we already have an area formula. (rectangle)



Students should tape the  
rectangle down on a page in  
their math notebooks,  
leaving room around it to  
take notes.



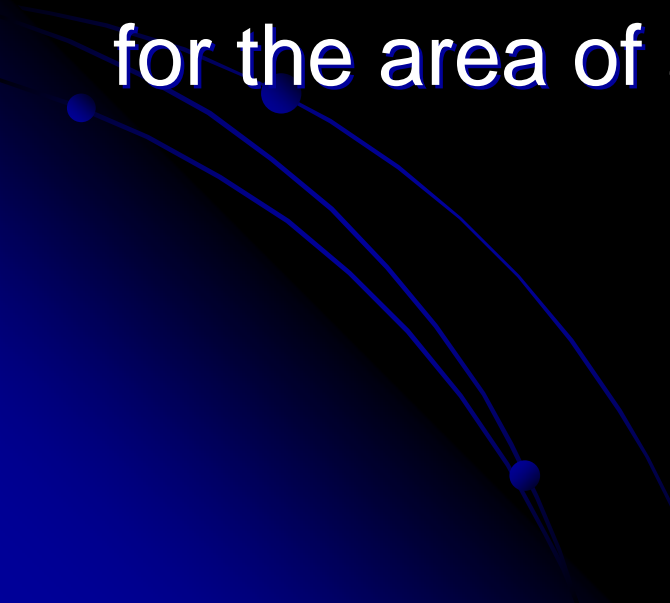
# formula

1. As students begin to see the two pieces can form a rectangle, the instructor can begin to ask students for ways to find the area of the rectangle. ( $A=b * h$ )
- 

I will reinforce the formula

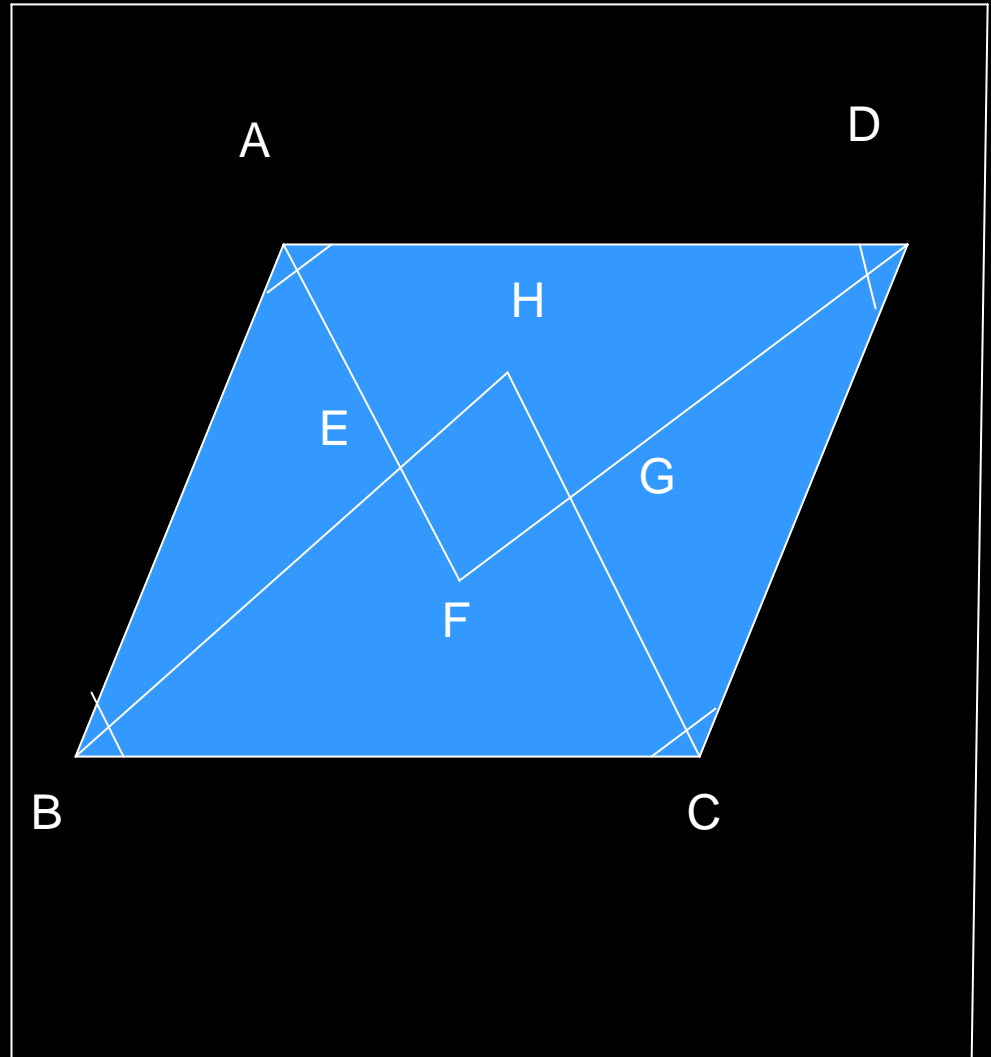
$$A=b * h$$

Students should generalize that the formula for the area of a rectangle must be the same for the area of a parallelogram.



# HOMWORK

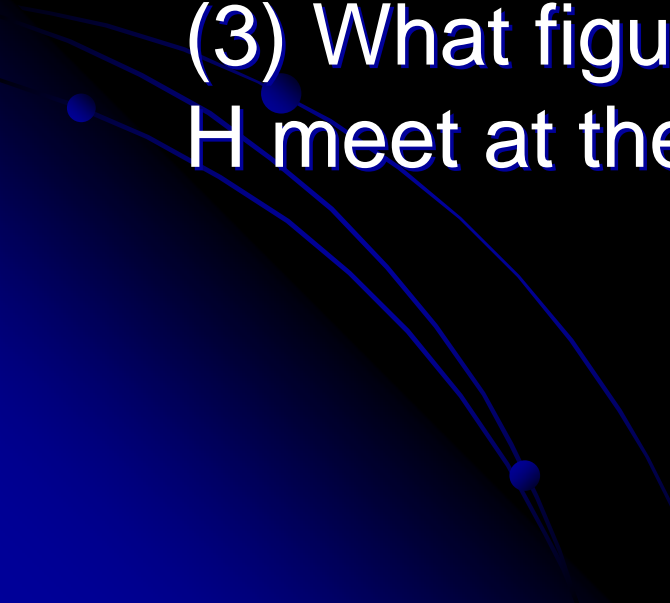
- Problem about parallelogram



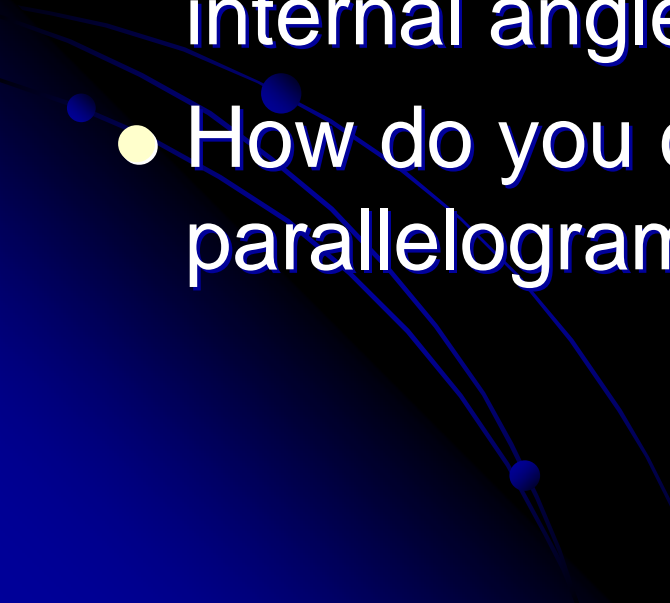
# Problem

- In the right figure, ABCD is a parallelogram. The lines AF, BH, CH and DF are the bisectors of the angles A, B, C and D. EFGH is the quadrilateral formed by the four lines.

# Questions:

- (1) What quadrilateral is EFGH? Why that?
  - (2) What Figure is ABCD when EFGH is a square?
  - (3) What figure is ABCD when E, F, G and H meet at the same point.
- 

# Closure:

- How you can describe a parallelogram?
  - A parallelogram can be considered a regular polygon?
  - How do you calculate the sum of the internal angles of a parallelogram?
  - How do you calculate the area of the parallelogram?
- 

# Textbook

- *Modification of “Development of Area Formulas--Parallelogram” lesson from Math in the Middle Handbook, Prentice Hall, 1993.*
- Homework from textbook:
  1. Do the exercise from page 85; parallelograms.
  2. Solve the problem from page 109; parallelograms and applications.