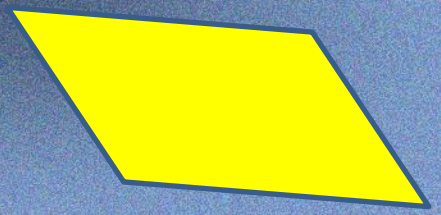
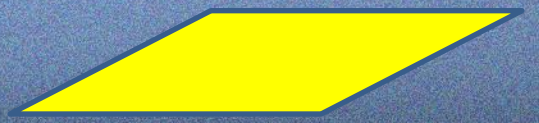
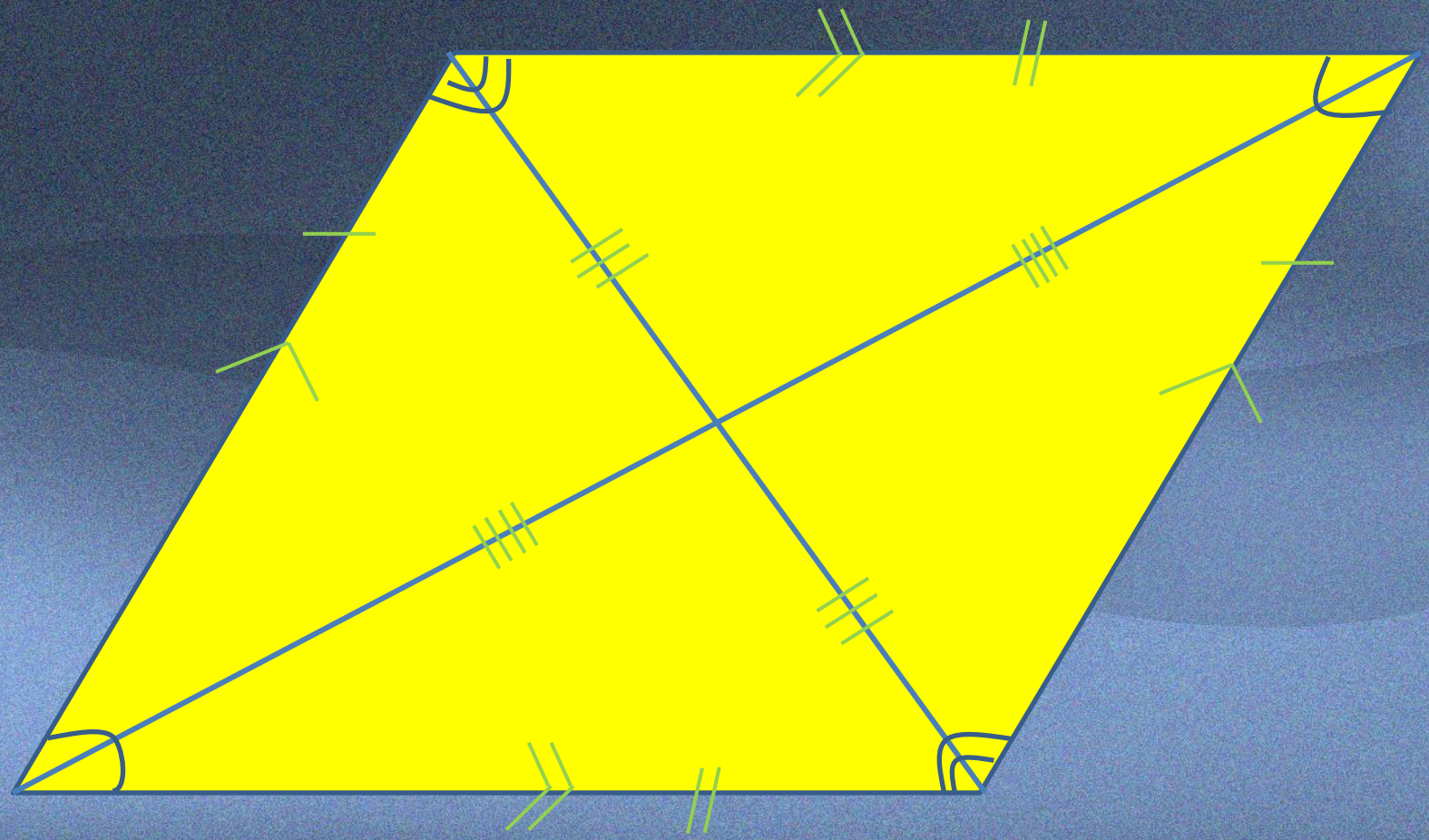
IC 29 Properties of Parallelograms

Parallelogram:
A quadrilateral with both pairs of opposite sides parallel.







Parallelograms have:

1) Both pairs of opposite sides parallel

2) Both pairs of opposite sides congruent

3) Both pairs of opposite angles congruent

4) Consecutive pairs of angles supplementary

5) Both diagonals bisect the other/diagonals bisect each other.

Slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{rise}{run}$$

What can slope tell us?

Same slopes $\rightarrow$ parallel

Opp/reciprocal slopes $\rightarrow \perp$

Distance Formula/Pythagorean Thm.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$a^2 + b^2 = c^2$$

What can distance/Pythagorean Thm tell us?

Lengths of segments and whether they are congruent or not

1. Does the quadrilateral formed by the following points fit the properties that we found to be true for parallelograms today? Show mathematical evidence to support your answer.

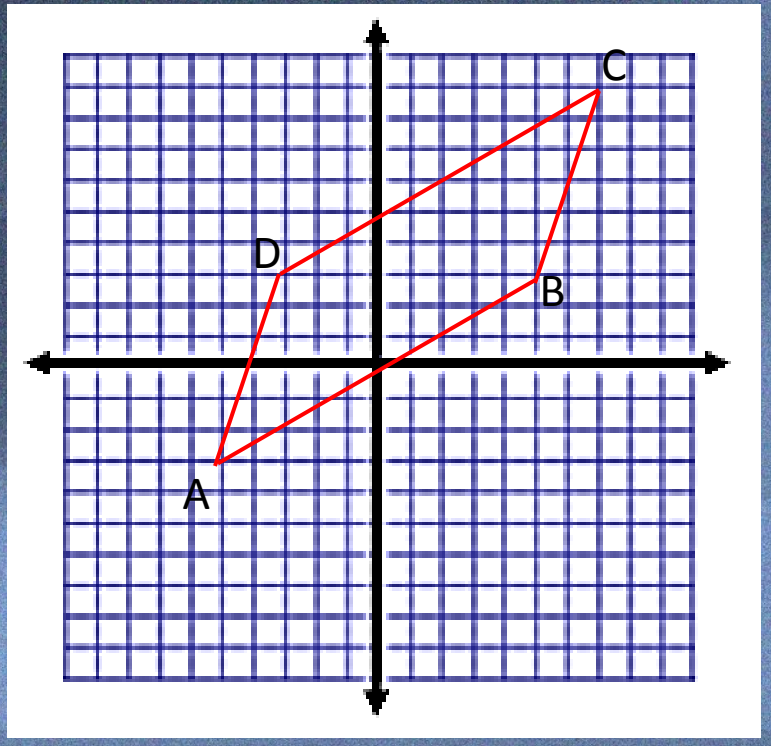
The vertices of ABCD are A(-5, -3), B(5, 3), C(7, 9), and D(-3, 3).

$$m_{AD} = \frac{3+3}{-3+5} = \frac{6}{2} = 3$$

$$m_{BC} = \frac{9-3}{7-5} = \frac{6}{2} = 3$$

$\}$ //

$$m_{DC} = \frac{3-9}{-3-7} = \frac{-6}{-10} = \frac{3}{5}$$

$$m_{AB} = \frac{3+3}{5+5} = \frac{6}{10} = \frac{3}{5}$$

$\}$ //