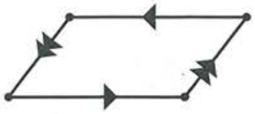
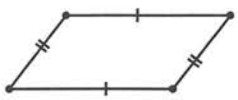
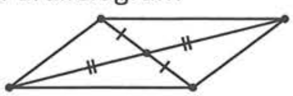
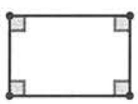
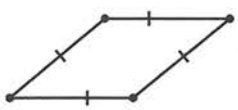
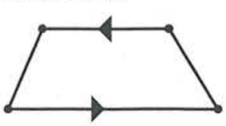
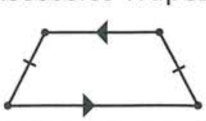
Geometry – Mr. Bo
Unit 6 – Day 6 Notes

Name: ____________________
Dates: __________

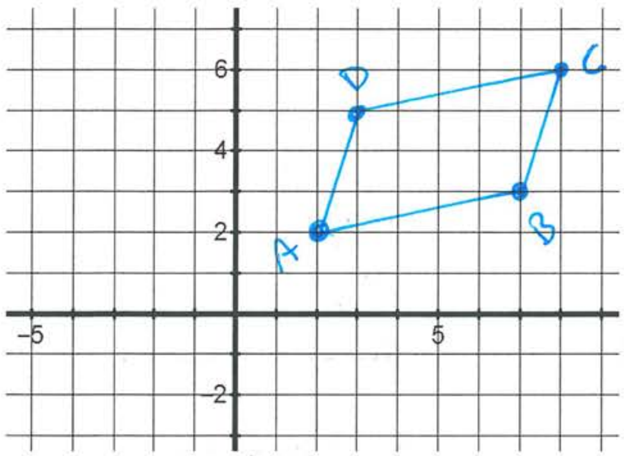
Coordinate Geometry Proofs - Quadrilaterals

To Prove	Need to Show	Formulas to Use
Parallelogram 	opp. sides ∥	slope
Parallelogram 	opp. Sides ≅	Distance
Parallelogram 	Diags. bisect eachother	midpoint.
Rectangle 	4 Right ∠'s (4 ≅ ∠'s)	Slope.
Rhombus 	4 ≅ sides	distance
Square 	4 ≅ sides + 4 ≅ ∠'s	Slope + Distance
Trapezoid 	1 pair ∥ Sides + 1 pair non-∥ sides	Slope.
Isosceles Trapezoid 	Trapezoid (see trap above) + non ∥ sides ≅	slope + distance

Example:

Given: Quadrilateral ABCD with A(2,2), B(7,3), C(8,6), D(3,5).

Prove: ABCD is a Parallelogram.



$$\left.\begin{array}{l} \text{Slope } \overline{AD} = \dfrac{5-2}{3-2} = \dfrac{3}{1} \\[2ex] \text{slope } \overline{BC} = \dfrac{6-3}{8-7} = \dfrac{3}{1} \end{array}\right\} \overline{AD} \parallel \overline{BC}$$

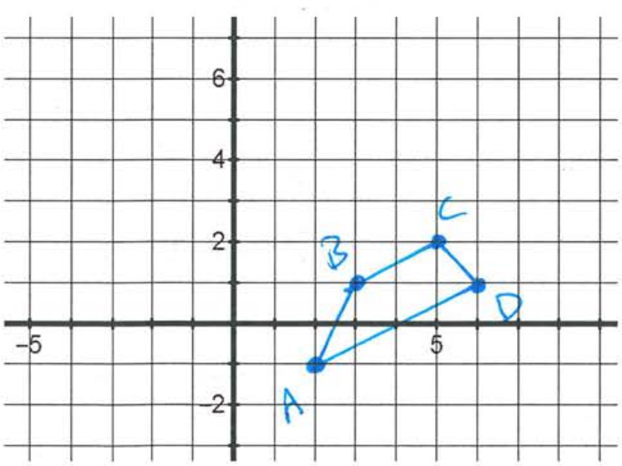
$$\left.\begin{array}{l} \text{Slope } \overline{DC} = \dfrac{6-5}{8-3} = \dfrac{1}{5} \\[2ex] \text{Slope } \overline{AB} = \dfrac{3-2}{7-2} = \dfrac{1}{5} \end{array}\right\} \overline{DC} \parallel \overline{AB}$$

ABCD is a ∥-ogram because it has 2 pairs of ∥ sides.

Example:

Given: Quadrilateral ABCD with A(2,-1), B(3,1), ~~B~~C(5,2), D(6,1).

Prove: Quadrilateral ABCD is a Trapezoid.



$$\left.\begin{array}{l} \text{Slope } \overline{BC} = \dfrac{2-1}{5-3} = \dfrac{1}{2} \\[2ex] \text{Slope } \overline{AD} = \dfrac{1--1}{6-2} = \dfrac{2}{4} = \dfrac{1}{2} \end{array}\right\} \overline{BC} \parallel \overline{AD}$$

$$\left.\begin{array}{l} \text{Slope } \overline{AB} = \dfrac{1--1}{3-2} = \dfrac{2}{1} \\[2ex] \text{Slope } \overline{CD} = \dfrac{2-1}{5-6} = \dfrac{1}{-1} \end{array}\right\} \overline{AB} \nparallel \overline{CD}$$

ABCD is a trapezoid because it has only 1 pair of ∥ sides.