## Day 1 - Proving All Parallelograms

1. The coordinates of Quadrilateral $A B C D$ are $A(-3,1), B(-2,4), C(5,1), D(4,-2)$
a. Algebraically verify that the Quadrilateral is a Parallelogram by showing that opposite sides are parallel.
b. Determine the midpoint of $\overline{A C}$ and $\overline{B D}$ (What would it suggest if they are the same?)
2. The coordinates of Quadrilateral $Q R S T$ are $Q(-3,1), R(-2,4), S(4,2), T(3,-1)$
a. Algebraically verify that the Quadrilateral is a Rectangle by showing that consecutive sides are perpendicular.
b. Algebraically verify the diagonals $\overline{Q S}$ and $\overline{R T}$ are congruent.
3. Given that the 3 points shown at the right are vertices of a parallelogram, find all of the possible points of the fourth point that would create a parallelogram. There are 3 of them draw each one.


4. The coordinates of Quadrilateral JKLM are $J(-2,1), K(-2,6), L(2,3), M(2,-2)$
c. Algebraically verify that the Quadrilateral is a Rhombus by showing that all sides are congruent.
d. Algebraically verify the diagonals $\overline{J L}$ and $\overline{K M}$ are perpendicular.
