Name:_____   **Date:**_____

Geometry Notes CG - 10: Coordinate Geometry Proofs

Review:

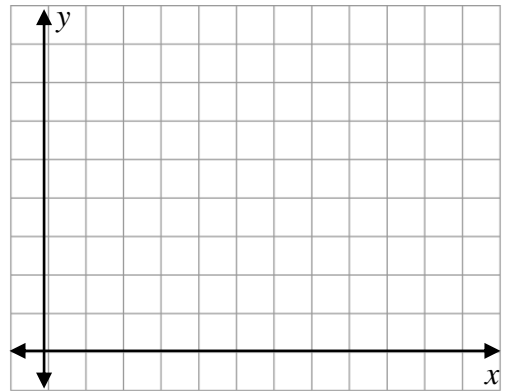 To prove two segments are congruent, show they have the

 To prove two segments are parallel, show they have

 To prove two segments are perpendicular, show they have

 To prove two segments bisect each other, show they have

Ex: Quadrilateral *ORCA* has vertices *O*(0, 0), *R*(2, 5), *C*(11, 8) and *A*(9, 3).

 a. Prove that *ORCA* is a parallelogram.

 b. Prove that *ORCA* is *not* a rectangle.

 c. Prove that the diagonals of *ORCA* bisect each other.

1. Triangle *ABC* has vertices *A*(4, 0), *B*(8, 6), and *C*(0, 7).
    a. Prove that Δ*ABC* is isosceles.

    b. Find the coordinates of point *D* on $\overrightarrow{AB}$ so that $\overline{CD}$ is a median. (This part is *not* a proof.)

    c. Prove that median $\overline{CD}$ is also altitude of the triangle.

2. Triangle *JKL* has vertices at *J*(6, 0), *K*(10, 6) and *L*(0, 2).

    a. Find the coordinates of *M* and *N*, the midpoints of $\overline{JK}$ and $\overline{LK}$ respectively.

    b. Prove that $\overline{MN}$ is parallel to $\overline{JL}$.

    c Prove that $\overline{MN}$ is half the length of $\overline{JL}$.

3. Triangle *PQR* has vertices *P*(7, 1), *Q*(−1, 3) and *R*(2, 6).

    a. Prove that Δ*PQR* is a right triangle.

    b. Prove that the length of the median from the right angle to the hypotenuse is half the length of the hypotenuse. (Note: This turns out to be true for *all* right triangles.)