 Name: _____

G.G.43 Investigate, justify, and apply theorems about the centroid of a triangle, dividing each median into segments whose lengths are in the ratio 2:1

1. The vertices of a triangle ABC are A(4,5), B(6,1), and C(8,9). Determine the coordinates of the *centroid* of triangle ABC and investigate the lengths of the segments of the medians. Make a conjecture.

2. Using dynamic geometry software, construct the following figure in which point *C* is the *centroid* of ΔPQR . Show that point *P'* is the image of point *C* under a dilation centered at point *P* with ratio $\frac{3}{2}$ (i.e. $D_{P,\frac{3}{2}}(C) = P'$). Justify mathematically that $\frac{3}{2}$ is the correct ratio for the dilation. In similar fashion show that $D_{Q,\frac{3}{2}}(C) = Q'$) and $D_{R,\frac{3}{2}}(C) = R'$).