So, $a_{(GC)} = a_{(CI)}$ and I is a common pt

Thus, pts C, G & I are collinear

c) $\overrightarrow{GI} \overset{?}{=} \frac{1}{3}\overrightarrow{CI}$

Then, $X_{\overrightarrow{GI}} \overset{?}{=} \frac{1}{3}\overrightarrow{CI}$ And $Y_{\overrightarrow{GI}} \overset{?}{=} \frac{1}{3} Y_{\overrightarrow{CI}}$

$x_I - x_G \overset{?}{=} \frac{1}{3}(x_I - x_c)$ | $y_I - y_G \overset{?}{=} \frac{1}{3}(y_I - y_c)$

$1 - \frac{2}{3} \overset{?}{=} \frac{1}{3}(1-0)$ | $-2 + \frac{2}{3} \overset{?}{=} \frac{1}{3}(-2-2)$

$\frac{1}{3} \overset{\checkmark}{=} \frac{1}{3}$ | $\frac{-4}{3} \overset{\checkmark}{=} \frac{-4}{3}$

Thus $\overrightarrow{GI} = \frac{1}{3}\overrightarrow{CI}$.

* In triangle ACB, [CI] is the median relative to [AB] and G is a point on [CI] such that $\overrightarrow{GI} = \frac{1}{3}\overrightarrow{CI}$ so G is the centroid of ΔABC.

4th exercise:

1) Drawn