## *Laboratory 9*

1. Prove that the three medians of a triangle in general position (running from the center of an edge to the vertex on the opposite side) intersect in a single point (the center of gravity). Again, first design a helpful auxiliary Maple procedure. Instead of yesterday, please do this exercise with parametric definitions of straight lines.

2. Write a Maple procedure `plotell(a,b)` that plots an ellipse, whose implicit definition is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ by using a **rational parametric representation**. Note that for the circle the rational parametric representation was $(\frac{2t}{1+t^2}, \frac{1-t^2}{1+t^2})$. Experiment with restricted ranges for $t$.

3. **Challenge problem:** Design a Maple procedure that plots a linear map from 2D-space to 2D-space (given in parametric representation) by depicting the second value as a color hue. Your procedure is to plot only a patch of the plane delineated by parameter values $t = 0..1$. Seek help from Maple: `?plot[color]` and `?plots`. A circle depicting the hue values from 0 to 1 can be plotted by reading the Maple file `piechart.mpl` and running `piechart(20)`. Study and understand the procedure `piechart` before proceeding.