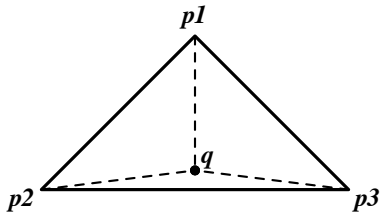
CMSC 23700 **Introduction to Computer Graphics** **Homework 4**
Winter 2010 **Due February 23**

One way to make level-of-detail (LOD) transitions is to use an α *fade*, where you lerp the α channel to blend the two LODs. For example, assume that you have a triangle $\triangle\langle \mathbf{p}_1, \mathbf{p}_2, \mathbf{p}_3\rangle$ and a vertex $\mathbf{q}$ that splits the triangle into two triangles $\triangle\langle \mathbf{p}_1, \mathbf{p}_2, \mathbf{q}\rangle$ and $\triangle\langle \mathbf{p}_1, \mathbf{q}, \mathbf{p}_3\rangle$ as follows:



At the coarse LOD, we just render $\triangle\langle \mathbf{p}_1, \mathbf{p}_2, \mathbf{p}_3\rangle$, and at the fine LOD, we render both $\triangle\langle \mathbf{p}_1, \mathbf{p}_2, \mathbf{q}\rangle$ and $\triangle\langle \mathbf{p}_1, \mathbf{q}, \mathbf{p}_3\rangle$, but in between we render all three triangles and use alpha blending to smooth the transition.

Assuming that $0 \leq t \leq 1$, give the blending equation that describes how to combine the two images as a function of t. It should be the case that when $t = 0$, just the coarse LOD is rendered and when $t = 1$, just the fine LOD is rendered.