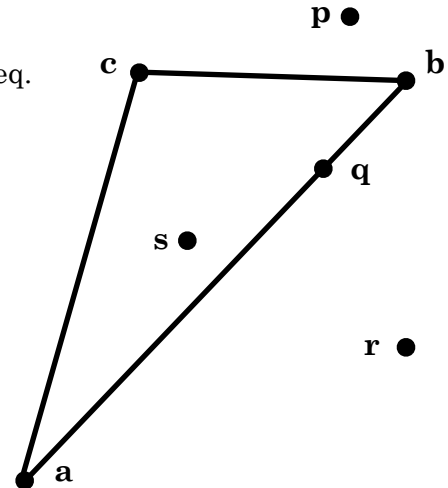# CS148: Reading Response, Tuesday 8 July

Shirley Ch. 2.7: Triangles, "A Pixel is Not A Little Square!" by Alvy Ray Smith

This reading introduces concepts needed for understanding interpolation and sampling, which we will be discussing this week when we talk about *rasterization*: the process of converting images described by geometrical primitives (points, lines, triangles, ...) into pixels for display or storage. Smith's article talks about reconstruction filters, which are used to change the size of an image. To learn more, check out Ch. 9 in Shirley.

1) Match the points **p, q, r, s** with their barycentric coordinates α, β, γ , where the points are defined as in eq. 2.30 (p.46), i.e., $\mathbf{p} = \alpha\mathbf{a} + \beta\mathbf{b} + \gamma\mathbf{c}$:

point	?
p	
q	
r	
s	

	α, β, γ
(i)	0.4, 0.4, 0.2
(ii)	0.2, 0.8, 0
(iii)	-0.2, 0.6, 0.6
(iv)	0.5, 0.9, -0.4

2) Why might it be beneficial to use triangles rather than quads to represent shapes in 3D?

3) Alvy Ray Smith gives an impassioned plea against the mental model that equates pixels with tiny squares. In one sentence, describe what a pixel is.

these ghosts are concerned and alarmed by their own "jaggies"

4) What is a box filter, and why does its use lead to poor quality images? When might it be a good choice?