COSC 3P98 Computer Graphics
B. Ross

Interior of Triangle Example

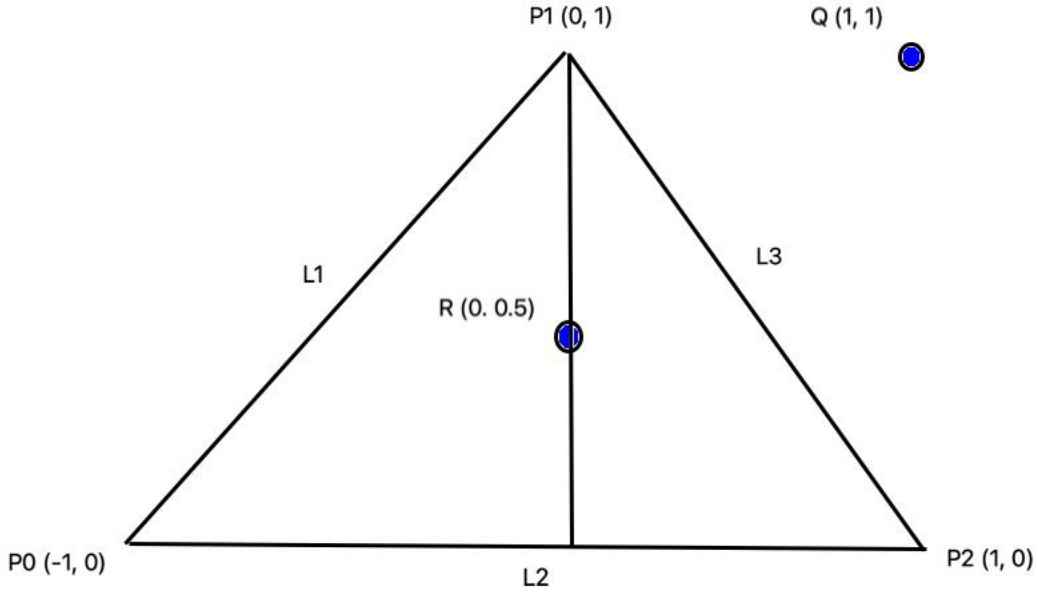
Given fast signed distance of point-to-line formula:

dist (Pa, Pb, P) = Ax + By + C

where: A = (y0 - y1)
B = (x1 - x0)
C = x1y1 - x1y0

Pa = (x0, y0),
Pb = (x1, y1)
and P = (x, y)

Here, Pa and Pb are 2 points on an edge of triangle (for example, vertices), and P is a point on the plane. We wish to test if P is inside or outside the triangle.



In the above illustration, testing point Q:
dist(P1, P0, Q) = -1
dist(P2, P1, Q) = 1
dist(P0, P2, Q) = -1

Since signs change, then Q is outside of triangle (could have stopped after second call to dist).

On the other hand, for point R:

dist(P1, P0, R) = -0.5
dist(P2, P1, R) = -0.5
dist(P0, P2, R) = -1

Since the signs are the same, R is in the interior of the triangle.