Listing Vertices Twice in a Row (Recreating a Zero Jump)

Sheet **7a** recreates an idea shown in the zero jumps *explainer*. Something is going on at the upper right vertex, (1,1), that creates an asymmetry at that vertex. *The way that asymmetry is created is simple, it is listed twice in a row.* This is equivalent to having the same vertex listed twice in a row (in the polygonal context, ***J*** = 0, ***n***, or multiples of ***n***).

These four images were created from a square with ***V*** = 5, the extra vertex comes from having (1, 1) listed twice in a row. Each image has ***S*** = 19 and varies by ***P***. It is worth briefly discussing each image (although if you already feel comfortable with the link above or the additional ***J*** = 0 analysis, you will be able to skim over this very quickly).

P **= 18, top left.** This image has curves at all but the (1,1) corner. Since ***P*** < ***S***, this image includes the VF. The (1,1) corner is not a single subdivision point on the VF, but instead is 20 such points (one more than ***S***). After all, ***S*** = 19 means there are 19 subdivisions between the first time vertex (1,1) is used, and the second time (1,1) is used. The curve at that corner is in fact various length horizontal or vertical lines, all of which either start or end at (1,1).

P **= 21, top right.** The bottom and left sides of the VF are not part of the image, but the top and right sides are included. The line from (18/19, 1) to (1, 18/19) is because 21 = 1+19+1, just like we saw in the ***J*** = 0 analysis when ***S*** = 5 and ***P*** = 7.

P **= 37, bottom left.** The curve at (1,1) is the same as the three curves for ***P*** = 18 above since 37 = 18+19.

P **= 47, bottom right.** This is the porcupine image. The only parts of the VF included in the image are individual points.