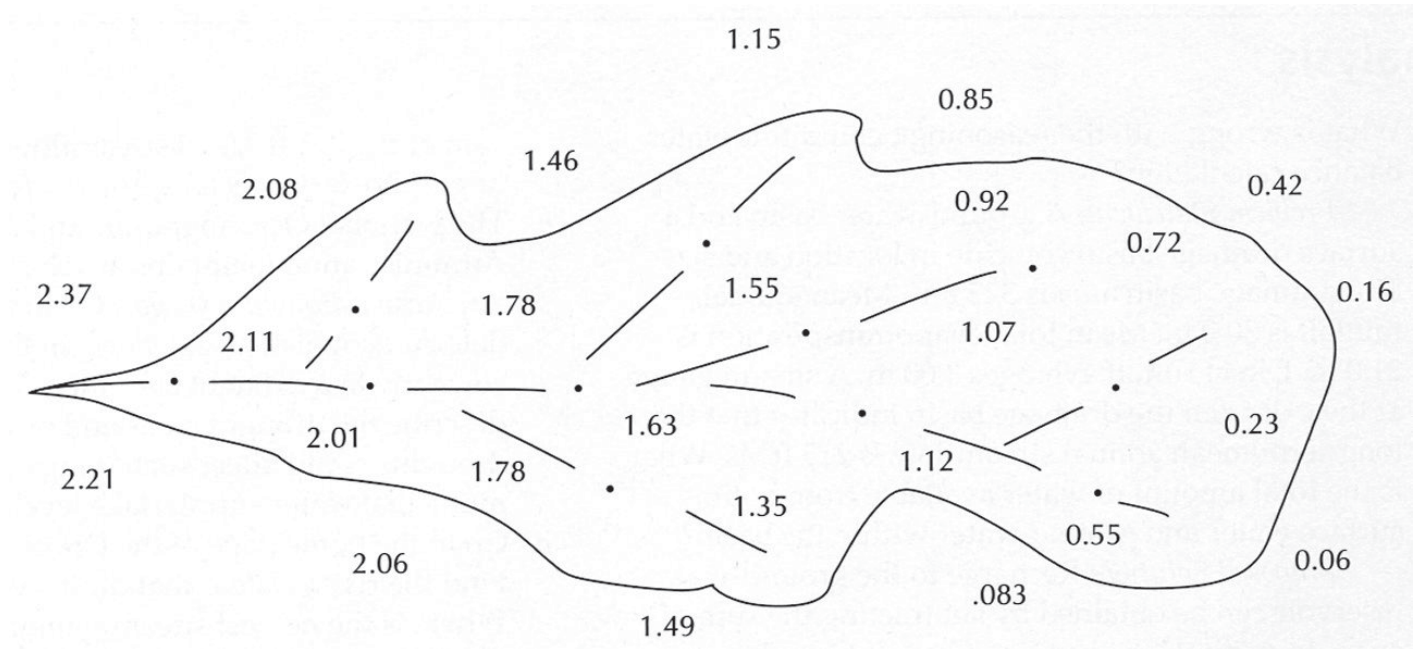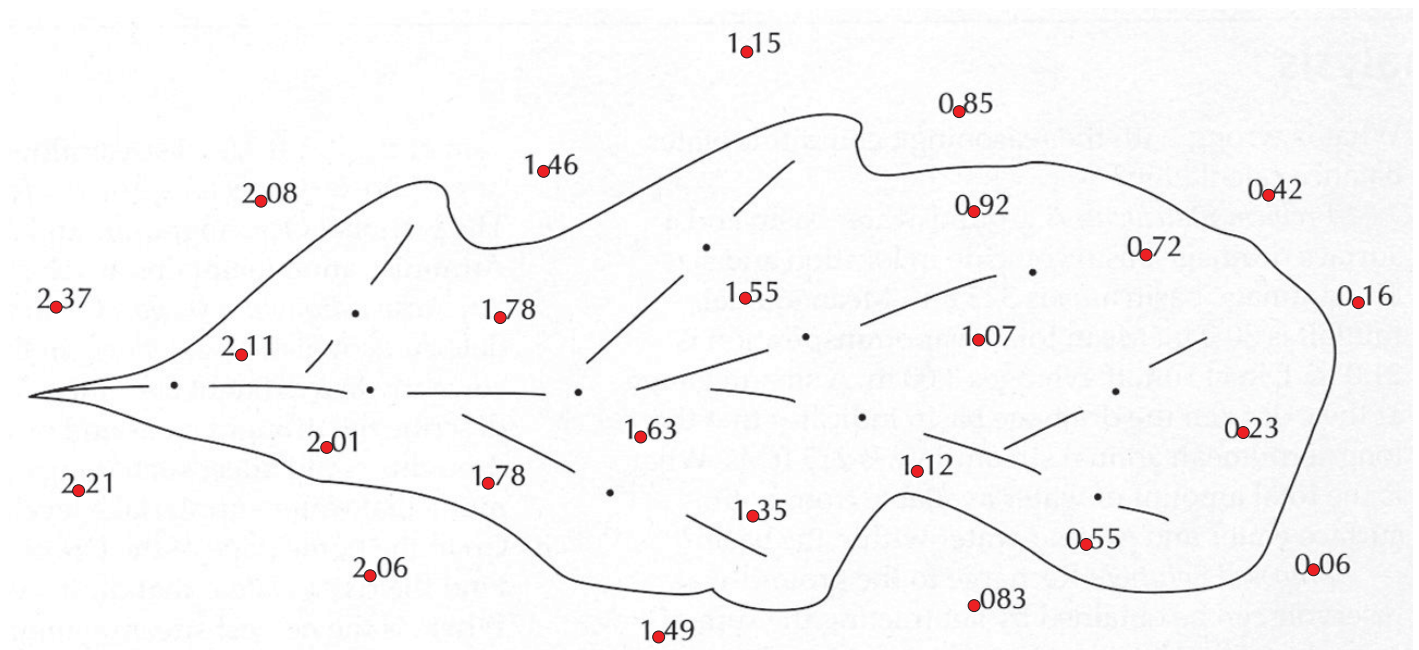**Thiessen Method for Problem 2.3 (Fetter, 2001)**

A drainage basin with rain gauge data (in cm), not uniformly distributed. We want to determine the the effective uniform depth of precipitation over the basin (essentially the average precipitation).

1.15
0.85
1.46
2.08
0.92
0.42
0.72
2.37
1.55
0.16
2.11
1.78
1.07
2.01
1.63
0.23
2.21
1.78
1.12
1.35
0.55
2.06
0.06
.083
1.49

Stations are the decimal points.

1.15
0.85
1.46
2.08
0.92
0.42
0.72
2.37
1.55
0.16
2.11
1.78
1.07
2.01
1.63
0.23
2.21
1.78
1.12
1.35
0.55
2.06
0.06
.083
1.49

Draw lines (dashed here) connecting the stations. This is actually trickier than it may first appear. The construction follows the rules of "Delaunay triangles."
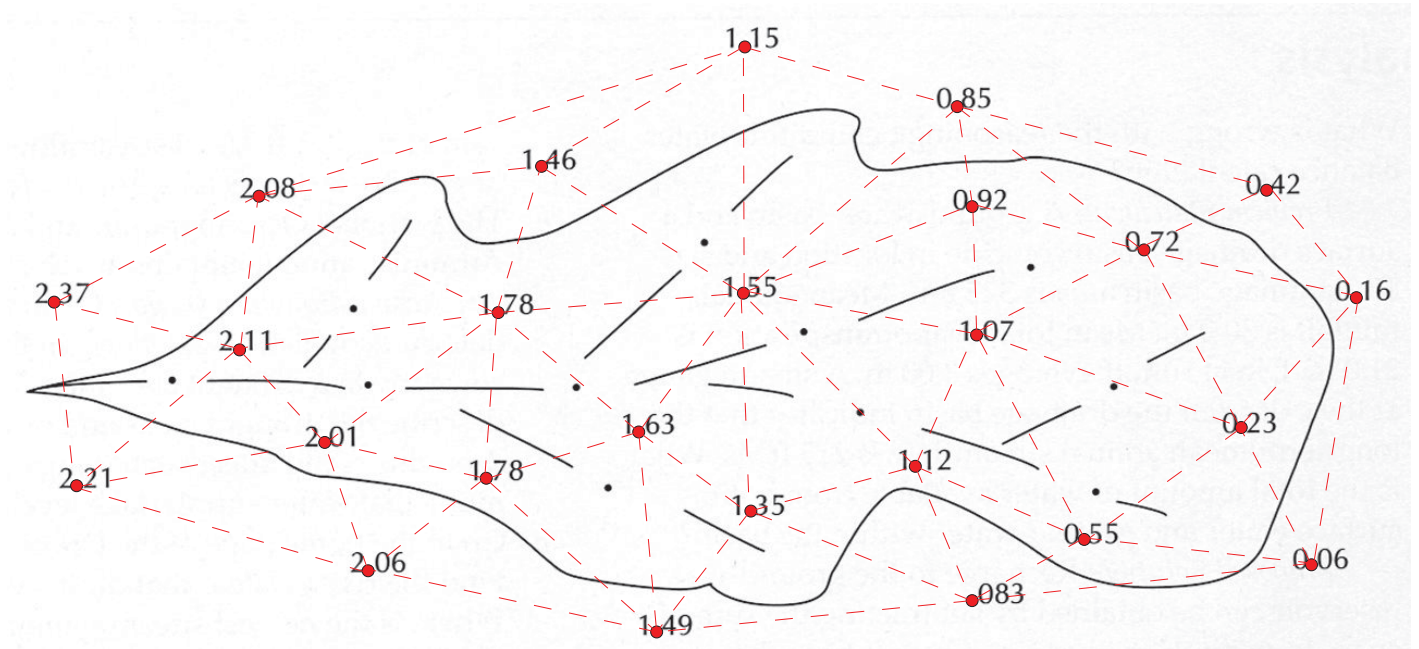

Draw lines bisecting the connecting lines. (bisectors are the gray lines)
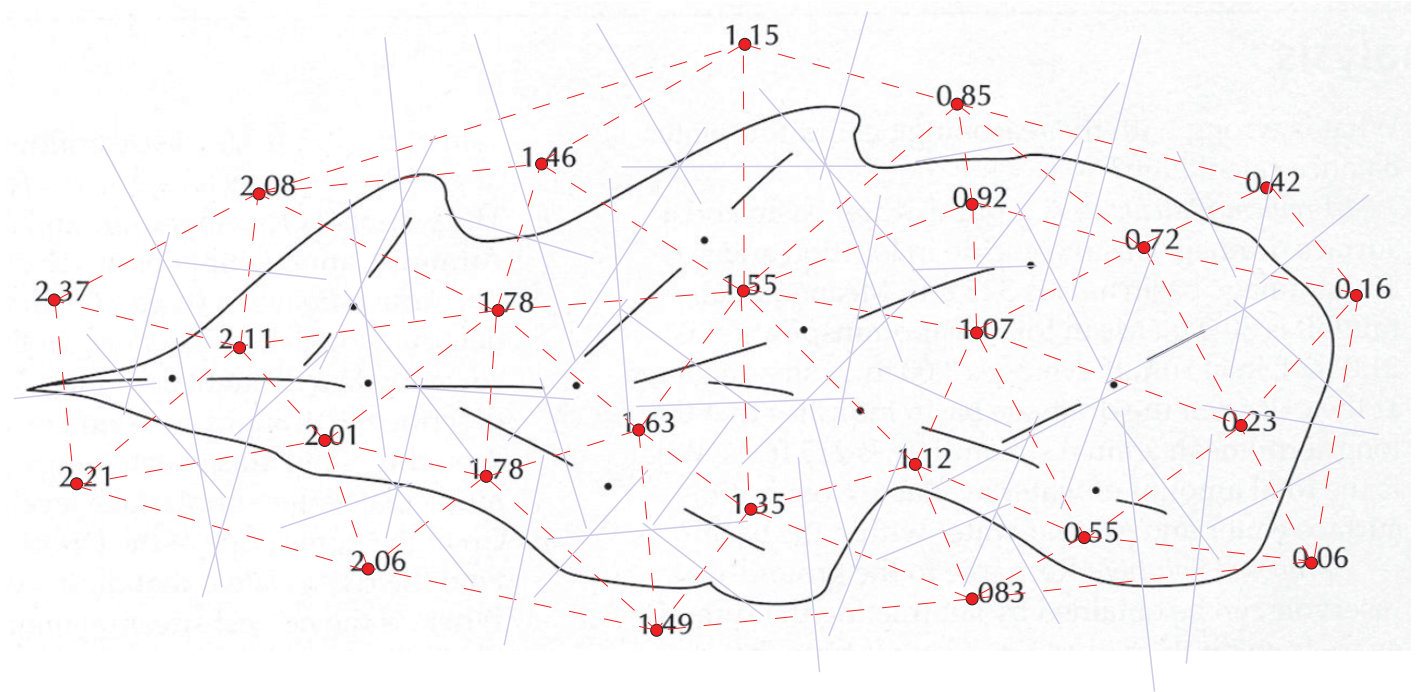
Extend (or shorten) bisectors to connect forming polygons surrounding each rain gauging station. These are called "Voronoi polygons."
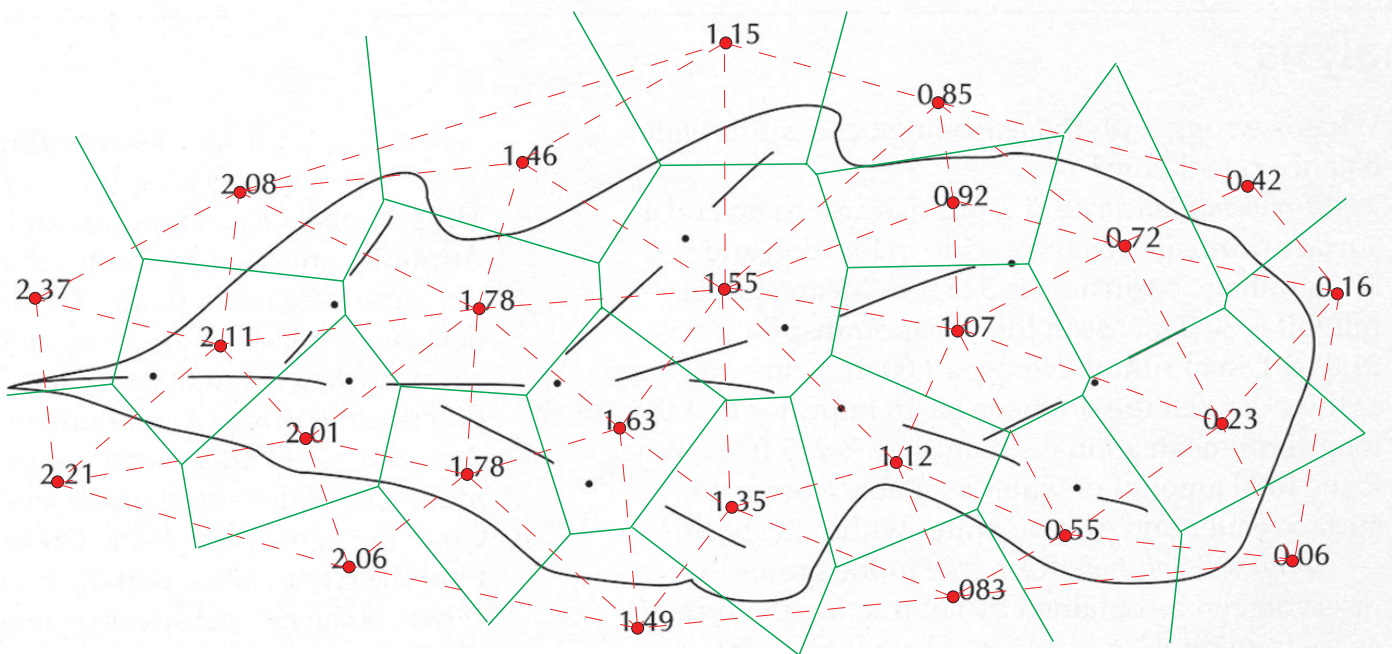
Any location inside a polygon is closer to the rain gauge at it's center than to any other rain gauge. In this method we assume that each polygon had the rainfall recorded by the central rain gauge, over the entire polygon. Since each polygon is a different size, we will need to determine what proportion of the drainage basin each polygon takes up.
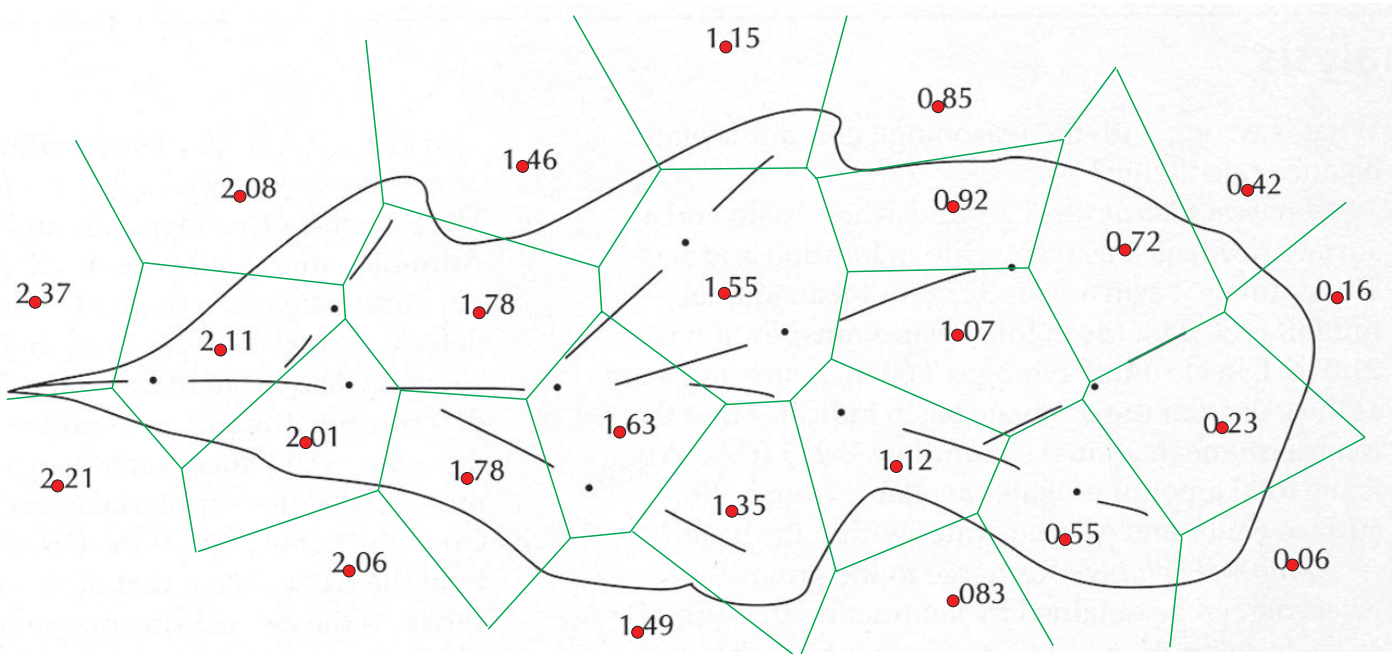
I've done most of the work for you. Now determine the relative area of each polygon (just the area inside the drainage basin) by overlyaing a grid and counting the boxes and half boxes inside each. Then do the math.