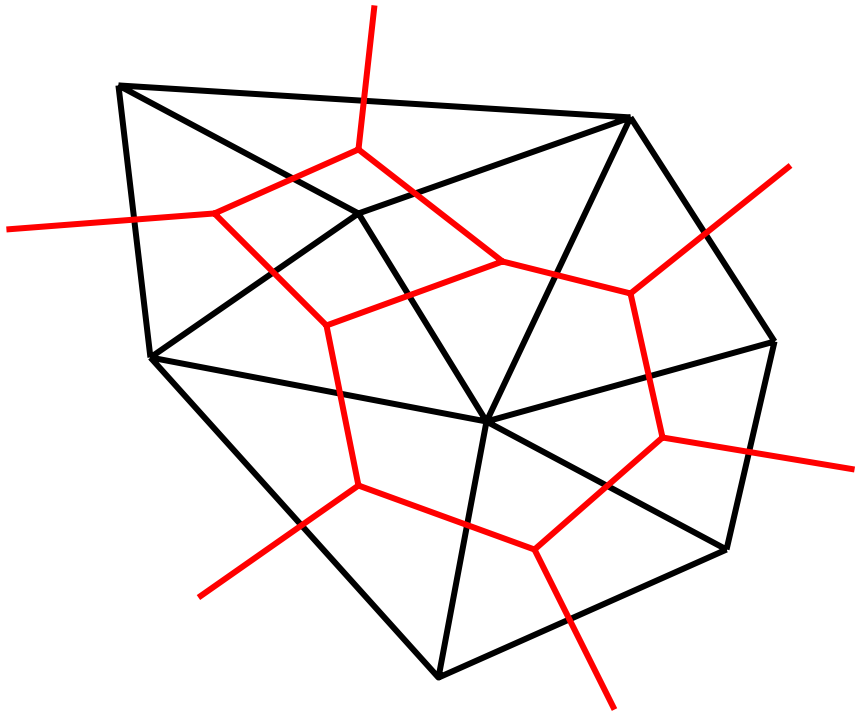
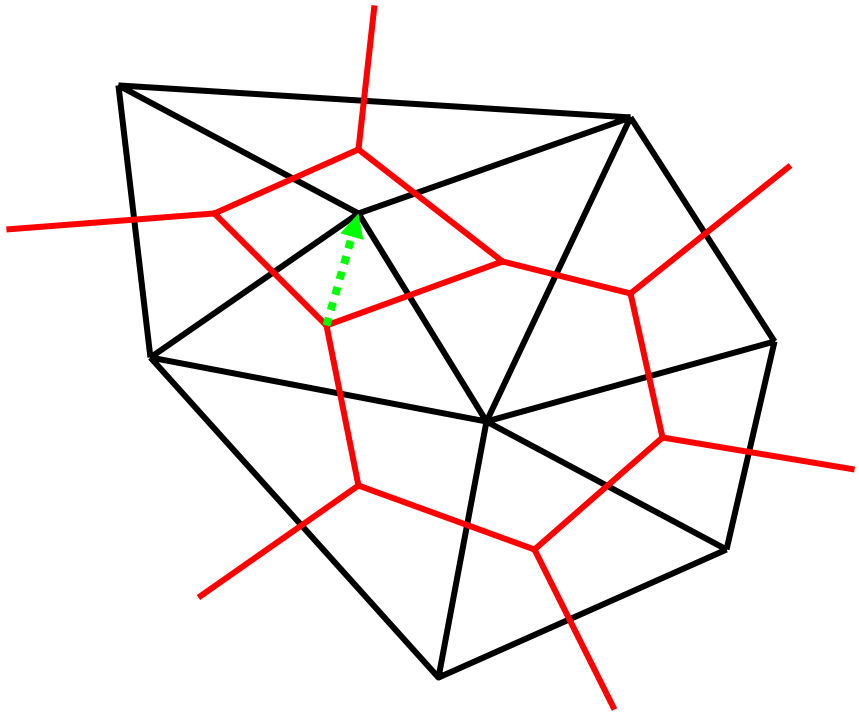
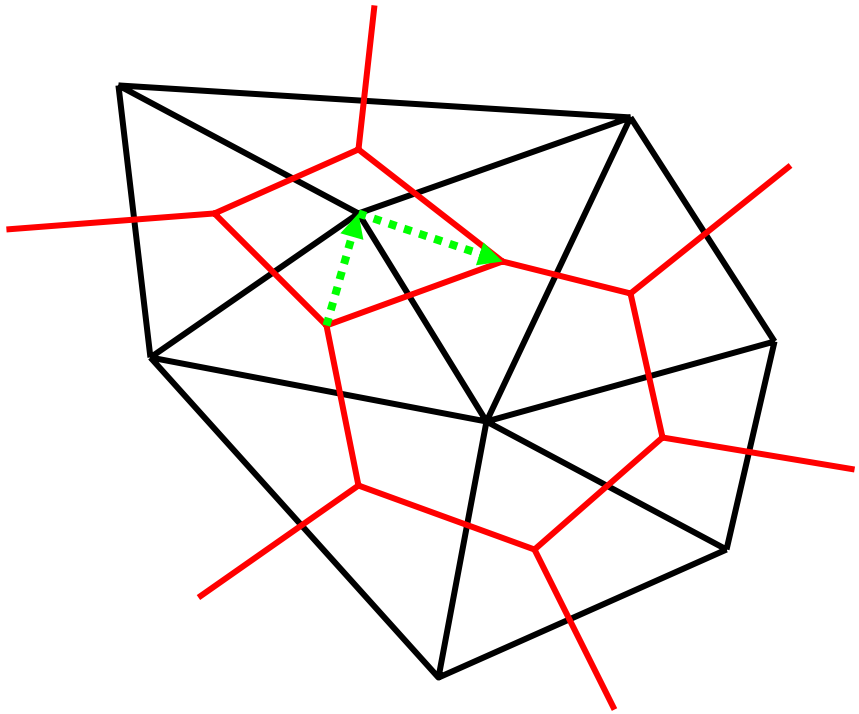
Here is a triangulation and its dual. Note the top-left dual cell has four sides, whereas bottom-right dual cell has five sides.



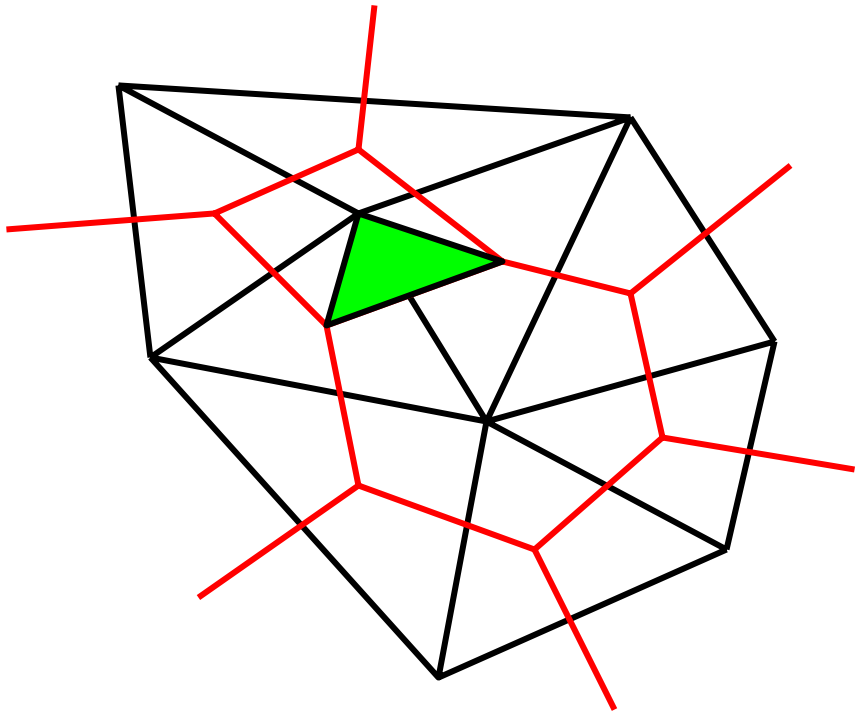
Begin at the center of any triangle, and draw a line to the center of any neighboring dual cell.



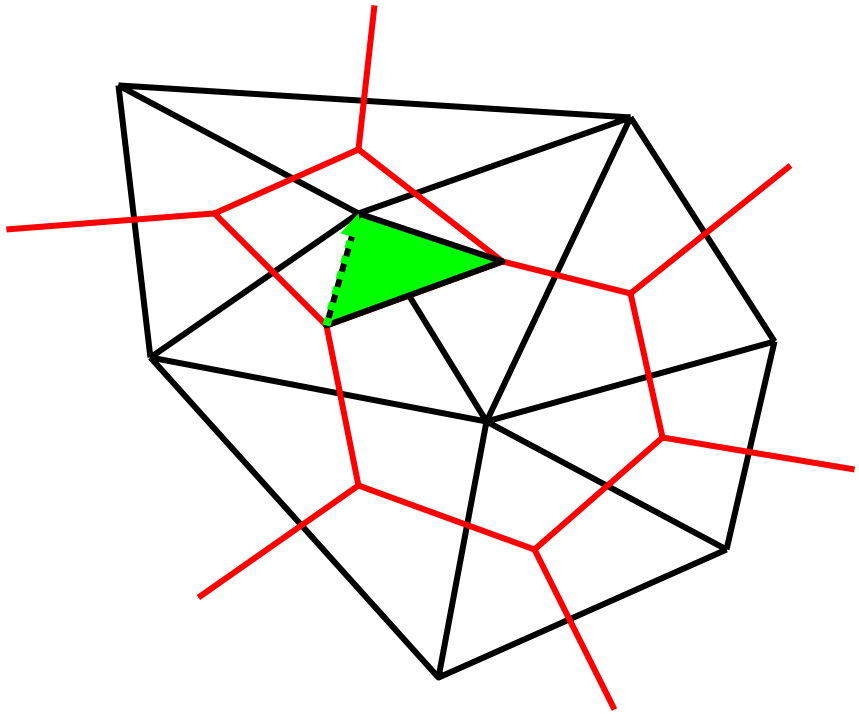
Next, draw a line from that point to either the nearest right (relative to the original node) or nearest left node of the dual cell.



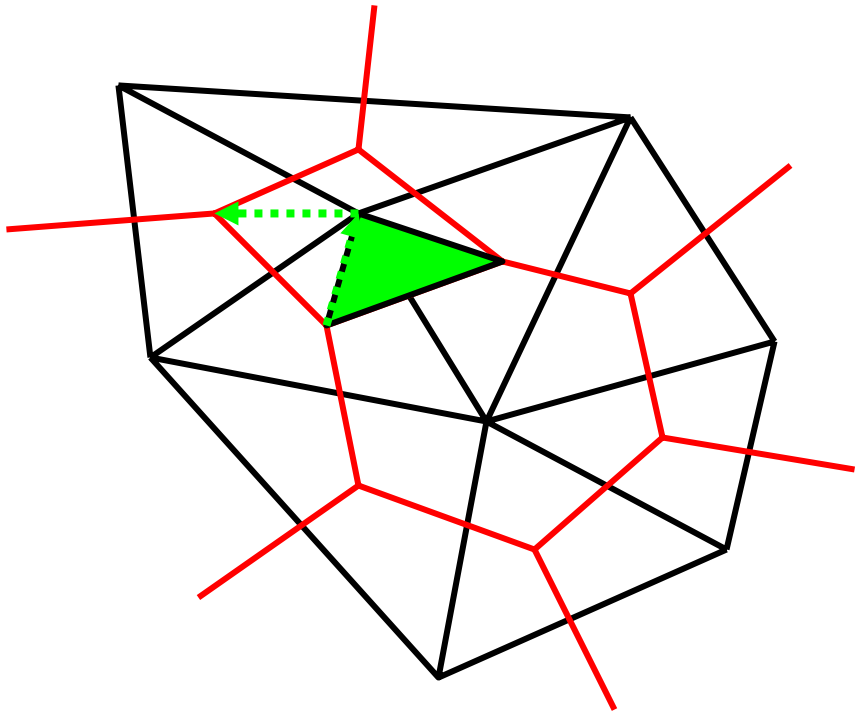
Finally, close the loop resulting in a triangle (as projected along the time direction, which is out of the page).



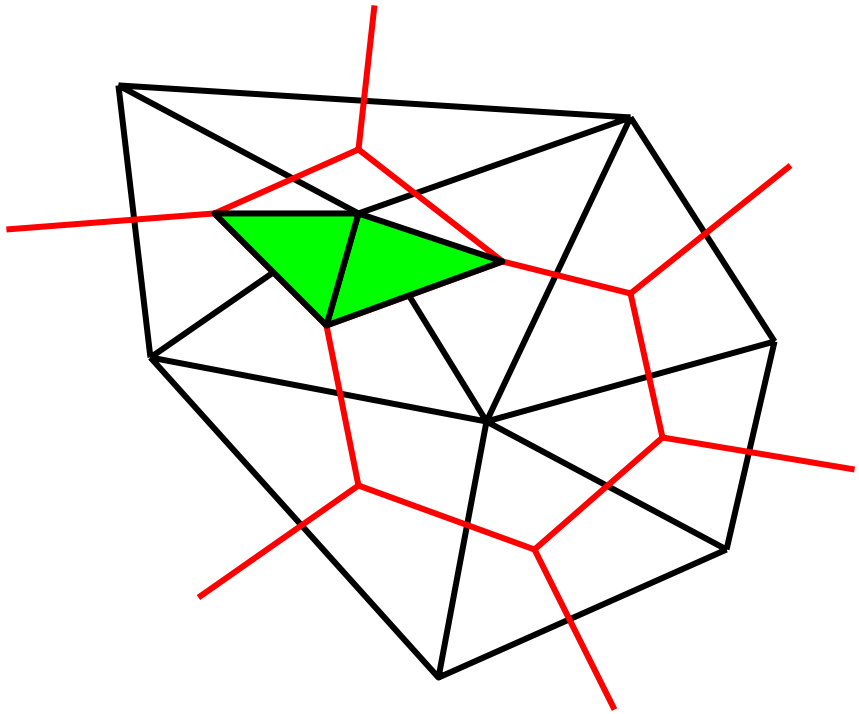
Beginning at the original node, begin another loop by retracing the same first step as last time.



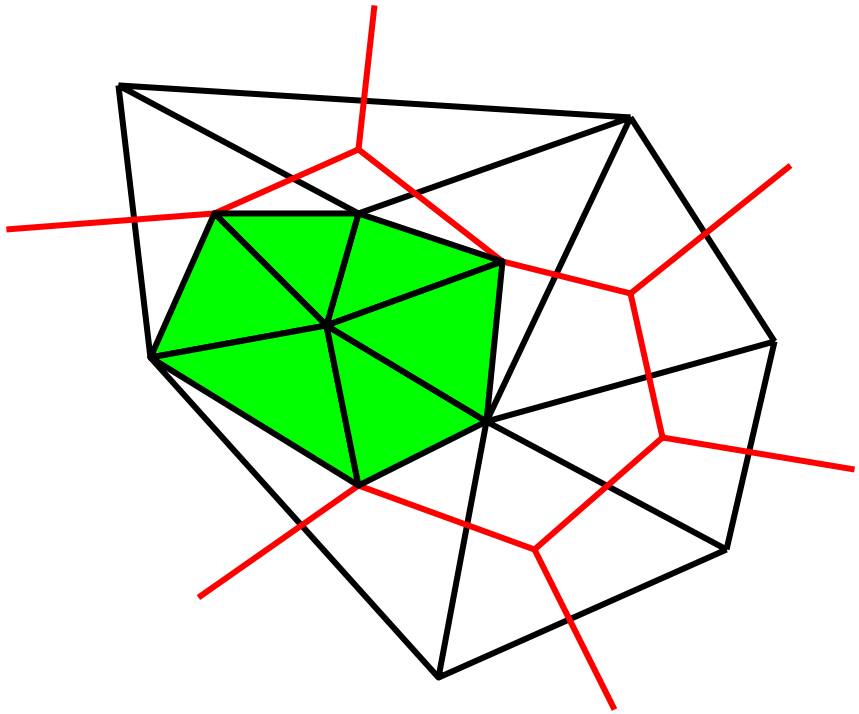
Now turn the other way.



Close the loop.



Continue around the original node until you have obtained the configuration below. I claim that we have just bounded a 3-diamond.



I think this picture makes it more clear that we've created a 3-diamond.