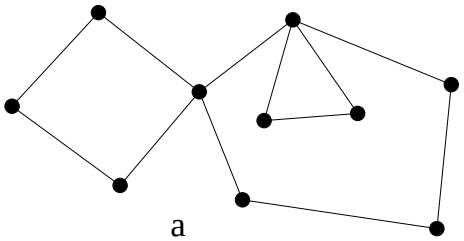
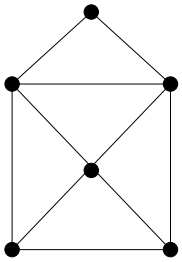
M1a

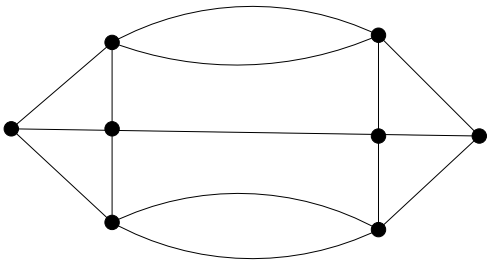
A. For each diagram below, try to trace the figure, going over each line (edge) exactly once and not lifting your pen from the paper.



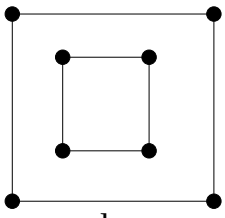
a



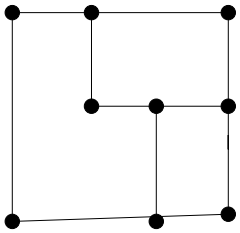
b



c



d



e

B. Compare your solutions with your neighbor's. For which diagrams was such a circuit possible? Did you always end where you started? If the tracing was not possible, how did you know that?

C. For each of the diagrams above, compute (a) the total number of edges and (b) the *sum* of the valences of the vertices. (For example, for the graph at the upper right, there are 10 edges, and the sum of the valences is 2 + 3 + 3 + 4 + 4 + 4 = 20.) What do you notice about the answers to (a) and (b)? Can you think of a good reason for what you noticed? What does your observation tell you about the *number* of vertices with *odd* valence?