

Attendance Quiz # 16 for Dr. Z.'s MathHistory Lecture 16

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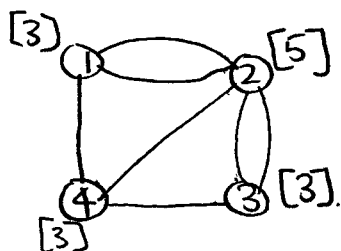
1. For each of the following adjacency matrices, draw the graph with that adjacency matrix, and decide whether or not it has (i) a **Eulerian cycle** (i.e. an itinerary that visits every edge exactly once, starting and ending at the same vertex

(ii) a **Eulerian path** (i.e. an itinerary that visits every edge exactly one, starting and ending at different vertices

(iii) Neither

[It is most convenient (for drawing) to label the vertices clockwise (or counterclockwise)

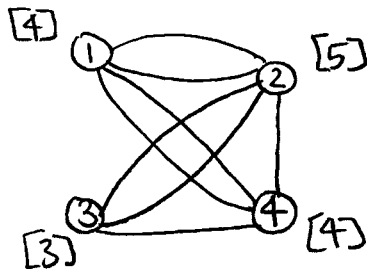
(a)



$$\begin{pmatrix} 0 & 2 & 0 & 1 \\ 2 & 0 & 2 & 1 \\ 0 & 2 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{pmatrix}$$

Neither.

(b)

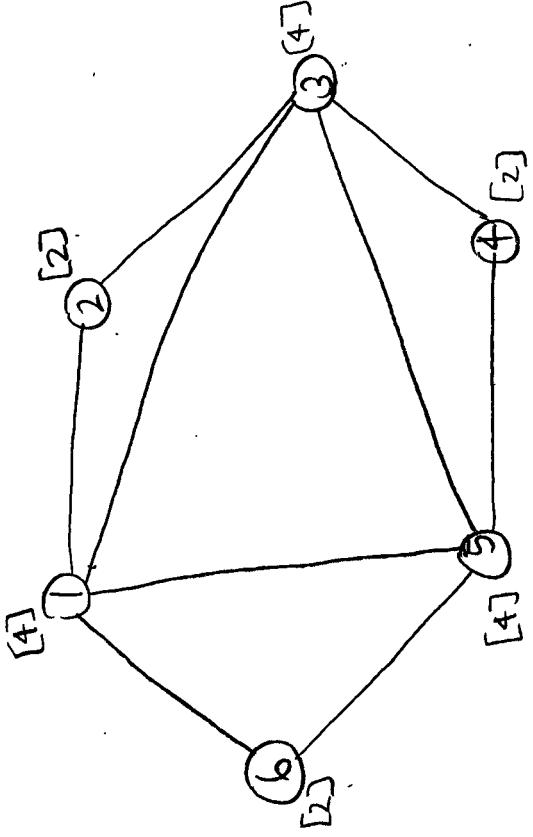


$$\begin{pmatrix} 0 & 2 & 0 & 2 \\ 2 & 0 & 2 & 1 \\ 0 & 2 & 0 & 1 \\ 2 & 1 & 1 & 0 \end{pmatrix}$$

Eulerian path.

(c)

$$\begin{pmatrix} 0 & 1 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 & 0 \end{pmatrix}$$



Eulerian cycle.