

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)

	1	2	3	4	degree
1	0	2	0	1	3
2	2	0	2	1	5
3	0	2	0	1	3
4	1	1	1	0	3

(ii) Neither.

(b)

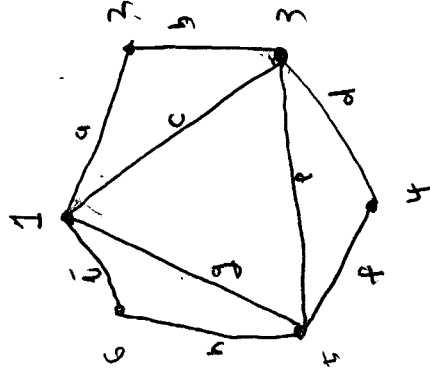
	1	2	3	4	degree
1	0	2	0	2	4
2	2	0	2	1	5
3	0	2	0	1	3
4	2	1	1	0	4
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(ii) Eulerian path

(c)

$2^a 3^b 2^c 1^d 2^e 4^f 1^g 4^h 3$

$$\begin{array}{r}
 1 \\
 2 \\
 3 \\
 4 \\
 5 \\
 6
 \end{array}
 \begin{pmatrix}
 0 & 1 & 1 & 0 & 1 & 1 \\
 1 & 0 & 1 & 1 & 0 & 0 \\
 1 & 1 & 0 & 1 & 1 & 0 \\
 0 & 1 & 0 & 1 & 0 & 1 \\
 1 & 0 & 0 & 1 & 1 & 0 \\
 1 & 0 & 0 & 0 & 1 & 1
 \end{pmatrix}
 \begin{array}{r}
 4 \\
 2 \\
 4 \\
 2 \\
 4 \\
 2
 \end{array}$$



(i) Eulerian cycle

1^a 2^b 3^d 4^f 5^h 6^e 1^c 3^e 5^h 1