Discrete Math: 6.1 Hamilton Paths & Hamilton Circuits
Date:

Name:
Period:

Key

Hamilton Path:

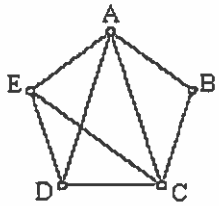
a path that includes every vertex of a graph once, and only once

Hamilton Circuit:

a circuit that includes each vertex once and only once - beginning and end vertex must be the same.

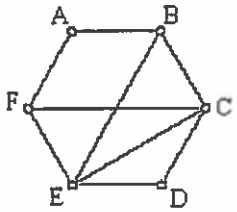
Find all possible Hamilton circuits in the given graphs. Use B as your point of reference.

1.



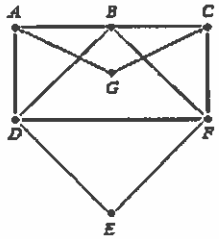
B, A, E, D, C, B
B, A, D, E, C, B
B, C, D, E, A, B
B, C, E, D, A, B

2.



B, A, F, E, D, C, B
B, A, F, C, D, E, B
B, C, D, E, F, A, B
B, E, D, C, F, A, B

Given the graph,



3. Find a Hamilton path that starts at A and ends at D.

A, G, C, B, F, E, D

4. Find a Hamilton circuit that starts at A and ends with the edge DA.

A, G, C, B, F, E, D, A

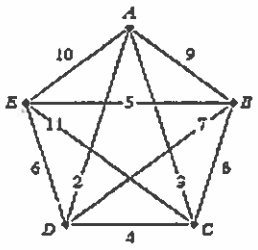
5. Find a Hamilton path that starts at A and ends at B.

A, G, C, F, E, D, B

6. Find a Hamilton path that starts at G and ends at D.

G, A, B, C, F, E, D

For the weighted graph,



7. Find the weight of edge DE.

6

8. Find two Hamilton circuits that starts with the edge $\overrightarrow{DE}$ and give their weights. Identify which one of the two is optimal.

D, E, A, B, C, D = 6 + 10 + 9 + 8 + 4 = 37

D, E, B, A, C, D = 6 + 5 + 9 + 3 + 4 = 27

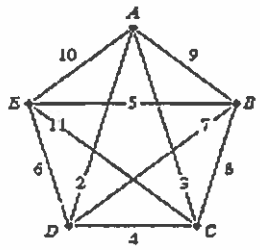
(optimal) → D, E, B, C, A, D = 6 + 5 + 8 + 3 + 2 = 24

9. Find the optimal Hamilton circuits that starts with the edge ED.

E, D, A, C, B, E

6 + 2 + 3 + 8 + 5 = 24

For the weighted graph,



10. Find the optimal Hamilton paths that starts at A and ends at C.

A, D, E, B, C

2 + 6 + 5 + 8 = 21