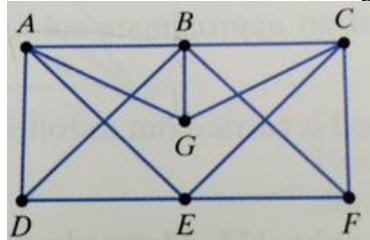


Prob/Stats
12.3 Worksheet

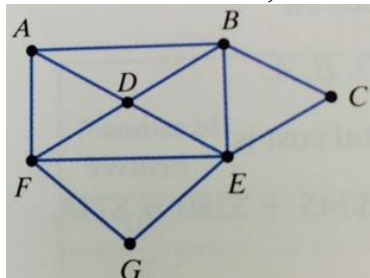
Name _____

In Exercise 1 and 2, use the graph shown.



1. Find a Hamilton path that begins at G and ends at E.
2. Find a Hamilton circuit that begins as A, G,...

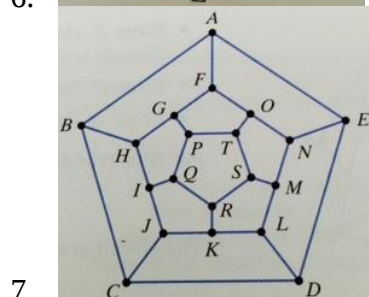
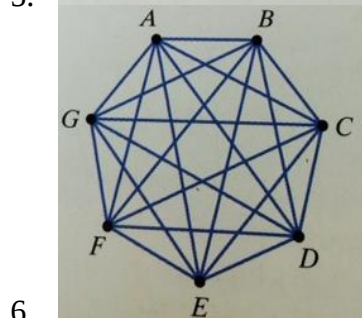
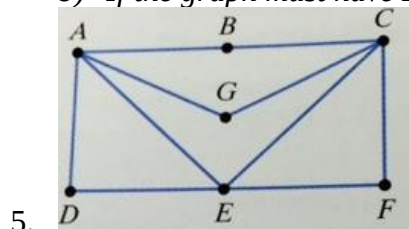
In Exercises 3 and 4, use the graph shown.



3. Find a Hamilton path begins at A and ends at G.
4. Find a Hamilton circuit that begins at F and ends with the pair of vertices D, F.

For each graph in Exercises 5-7,

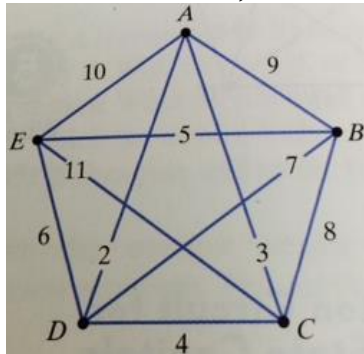
- a) Determine if the graph must have Hamilton circuits. Explain your answer.
- b) If the graph must have Hamilton circuits, determine the number of such circuits.



In Exercises 8 and 9, determine the number of Hamilton circuits in a complete graph with the given number of vertices.

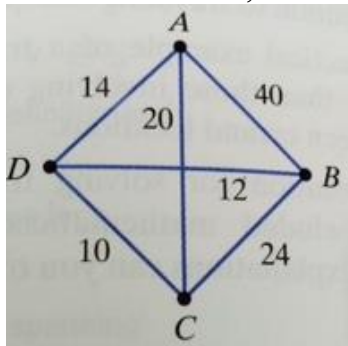
8. 4
9. 13

In Exercises 10-15, use the complete, weighted graph shown.



10. Find the weight of edge CE.
11. Find the weight of edge BD.
12. Find the total weight of the Hamilton circuit: A, B, C, E, D, A.
13. Find the total weight of the Hamilton circuit: A, B, D, C, E, A.
14. Find the total weight of the Hamilton circuit: A, B, D, E, C, A.
15. Find the total weight of the Hamilton circuit: A, B, E, C, D, A.

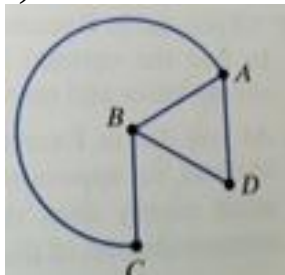
In Exercises 16-25, use the complete, weighted graph shown.



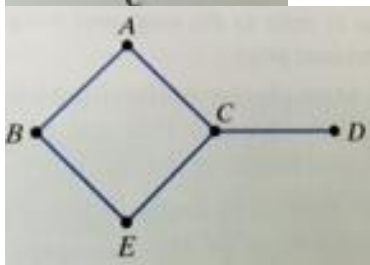
16. Find the total weight of the Hamilton circuit A, B, C, D, A.
17. Find the total weight of the Hamilton circuit A, B, D, C, A.
18. Find the total weight of the Hamilton circuit A, C, B, D, A.
19. Find the total weight of the Hamilton circuit A, C, D, B, A.
20. Find the total weight of the Hamilton circuit A, D, B, C, A.
21. Find the total weight of the Hamilton circuit A, D, C, B, A.
22. Use your answers from Exercises 16-21 and the Brute Force Method to find the optimal solution.
23. Use the Nearest Neighbor Method, with starting vertex A, to find an approximate solution. What is the total weight of the Hamilton circuit?
24. Use the Nearest Neighbor Method, with starting vertex B, to find an approximate solution. What is the total weight of the Hamilton circuit?
25. Use the Nearest Neighbor Method, with starting vertex C, to find an approximate solution. What is the total weight of the Hamilton circuit?

In Exercise 26 and 27, a graph is given.

- Modify the graph by adding the least number of edges so that the resulting graph is complete. Determine the number of Hamilton circuits for the modified graph.
- Give two Hamilton circuit for the modified graph in part (a)
- Modify the given graph by removing the least number of edges so that the resulting graph has an Euler circuit.
- Find an Euler circuit for the modified graph in part (c).

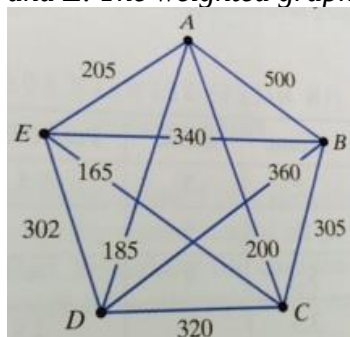


26.



27.

In Exercise 28, a sales director who lives in city A is required to fly to regional offices in cities B, C, and E. The weighted graph shows the one-way airfares between any two cities.



28. Use the Nearest Neighbor Method, with starting vertex A, to find an approximate solution.

What is the total cost for this Hamilton circuit?

In Exercises 29-31, you have three errands to run around town, although in no particular order. You plan to start and end at home. You must go to the bank, post office, and the market. Distances, in miles, between any two of these locations are given in the table.

	Home	Bank	Post Office	Market
Home	*	3	5.5	3.5
Bank	3	*	4	5
Post Office	5.5	4	*	4.5
Market	3.5	5	4.5	*

- Create a complete, weighted graph that models the information in the table.
- Use the Brute Force Method to find the shortest route to run your errands and return home. What is the minimum distance you can travel?
- Use the Nearest Neighbor Method to approximate the shortest route to run your errands and return home. What is the minimum distance given by the Hamilton circuit? How does this compare with your answer to Exercise 30?