- ❖ Write your name below on the space provided.
- ❖ This test has a total of 9 pages. Feel free to tear off the three pages. I do not need it returned.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test and be sure to mark the test to let me know the work is on the back. Label work accordingly.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test.
- ❖ Sorry, no extra credit this time, but thanks for reading the directions!
- ❖ Be sure to write neatly and in pencil. If I cannot read what was written or it is not in pencil, do not expect the problem to be graded.
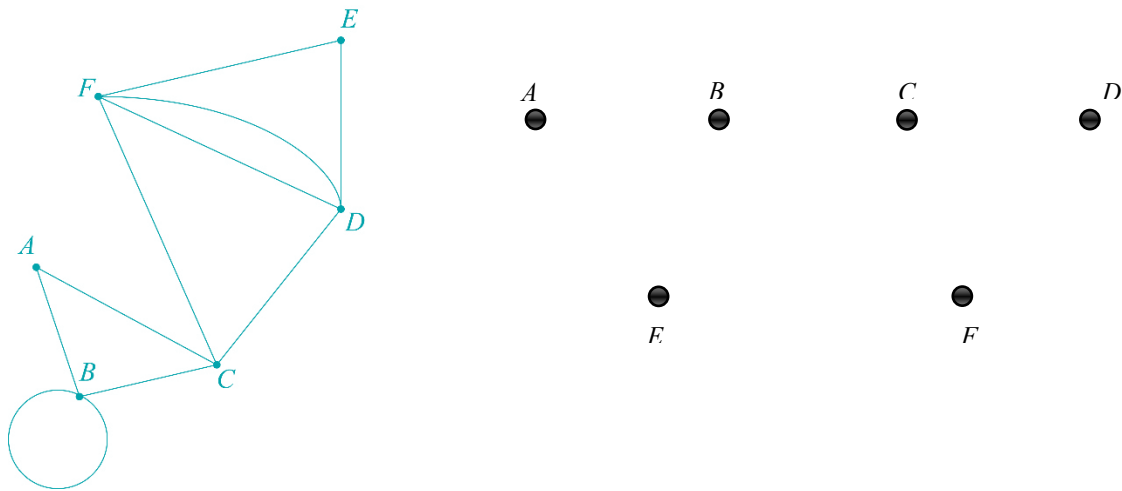- ❖ If you finish early, go over the test again.

Good luck!

| Number	Maximum	Score
1	4	
2	18	
3	6	
4	11	
5	4	
6	5	
7	10	
8	12	
9	6	
10	6	
11	6	
12	6	
13	6	
Total	100	

Name _____

Circle Final Answers

Be sure to show all unit fractions as needed.
Round only the final answer to two places as needed.

1) (4 points) Draw an equivalent graph to the given graph below by connecting the vertices:
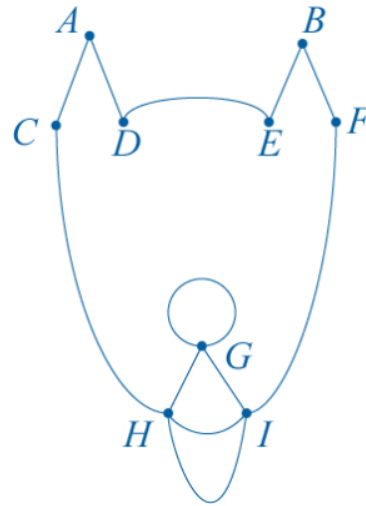

2) (9 points each) For the following graphs below, label each vertex with its degree. Also, determine if there is an Euler Circuit, Euler Path, or neither. **If there is an Euler Circuit or Euler Path, give an example of one.** If neither, explain why not:

a)
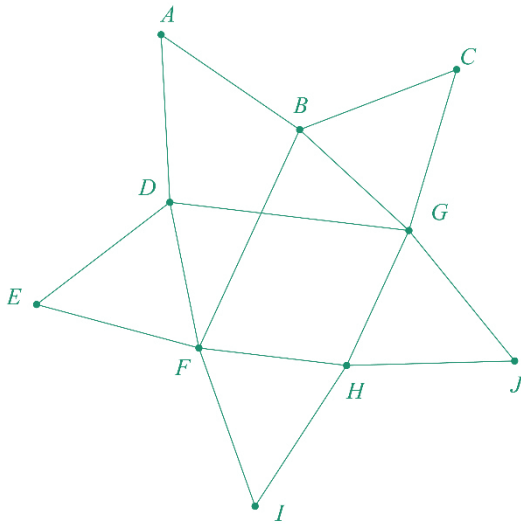
b)

3) (3 points each) Draw a graph that meets the following requirements or explain why the graph cannot exist.

a) A graph where every edge is a bridge and the total degree is 6:

b) A graph where every edge is a bridge and would also contain an Euler Circuit:

4) Mike needs to do some shopping for board games because he does not have enough. He finds the distances between the stores that he plans on visiting. The distances are in miles:

	Home	Giant Eagle	Target	Walmart
Home		2.9	1.8	3.2
Giant Eagle	2.9		4.9	3.6
Target	1.8	4.9		5.6
Walmart	3.2	3.6	5.6	

a) (2 points) Based on the information in the chart, draw a weighted graph below:

Home ●   ● Giant Eagle

Target ●   ● Walmart
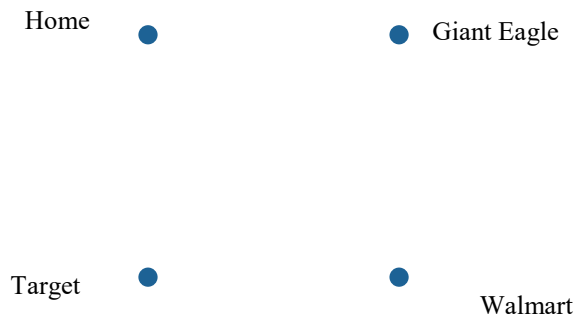
b) (6 points) List the three unique Hamilton Circuits for this graph and find the corresponding total weight. According to the Brute Force Method, which Circuit should Mike choose?
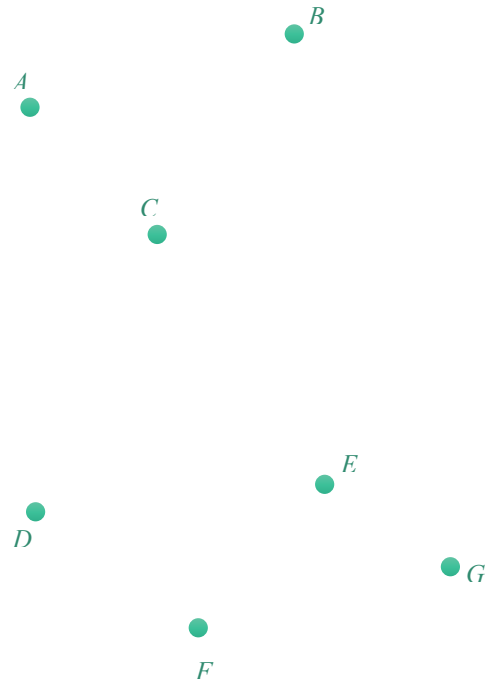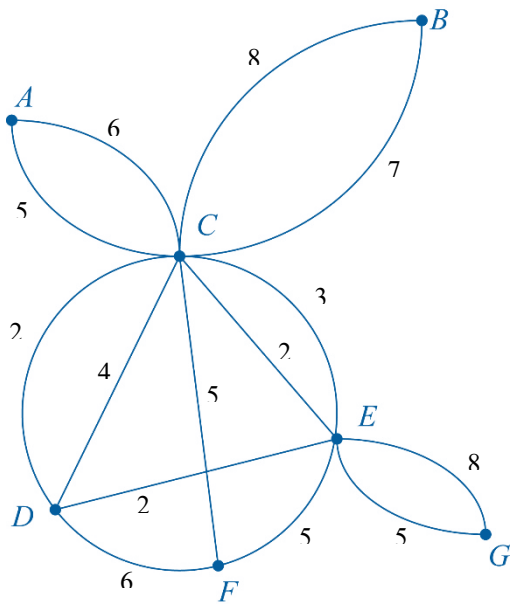
c) (3 points) For the same graph in part *a*, solve the problem using the Nearest Neighbor Method:

5) (2 points each) Define the following terms. Examples will not be accepted for credit:
a) Bridge   b) Tree

6) (5 points) For the weighted graph below, draw a minimal spanning tree. Also, declare what the minimal weight is:

7) (2 points each) For the following graph, select the **best** answer from the following list. Not all terms will be used:

Path   Circuit   Euler Path   Euler Circuit   Hamilton Path   Hamilton Circuit
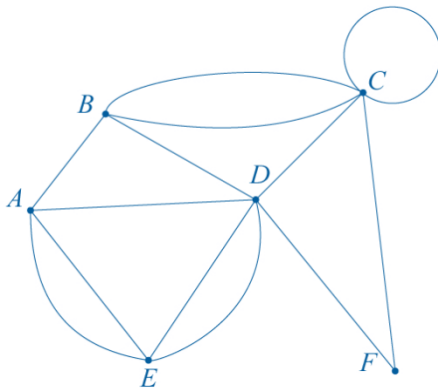
a) *ABCCFDEA*   _____

b) *BCFDEAB*   _____

c) *FDEABC*   _____

d) *FDEAB*   _____

e) *CCBCDBADEAEDFC*   _____

8) (3 points each) Convert as directed:

a) 27 yards to feet:

b) 67.5 centimeters to inches:

c) 10 feet to millimeters:

d) 10,020.6 mm to km:

9) (6 points) In 2023, the fastest car in the world, the Koenigsegg Jesko Absolut, could travel at a speed of 330 miles per hour. How has is this speed in meters per second?

10) (6 points) One curtain panel measures 42 inches by 80 inches. If the seamstress will use fabric that costs $20 per square yard, how many square yards does she need to make **two curtains** and how much will it cost for both? Do not round until the very end of the problem.

11) (6 points) A swimming pools plan is shown below. Assuming that the pool is 5 feet deep, how many gallons of water are necessary to fill it? Recall the area of a rectangle is length x width. The volume of a box is length x width x height.

7 ft

12 ft

8 ft

5 ft

12) (3 points each) According to the Guinness Book of World Records, Hercules the Liger is the largest and heaviest cat in the world, weighing in at a staggering 922 pounds. What is this weight in…

a) Ounces?   b) Kilograms?

13) (3 points each) Convert as directed:

a) $75°F$ to $°C$ b) $-15°C$ to $°F$