

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 5 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

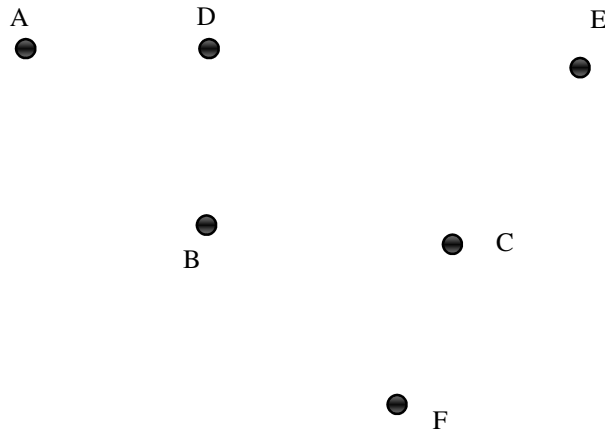
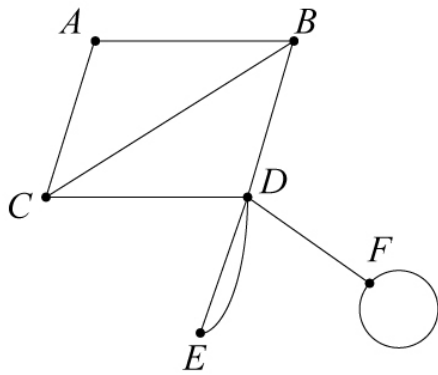
Number	Maximum	Score
1	4	
2	16	
3	6	
4	14	
5	6	
6	4	
7	8	
8	12	
9	6	
10	6	
11	6	
12	6	
13	6	
Total	100	

Name _____

Circle Final Answers

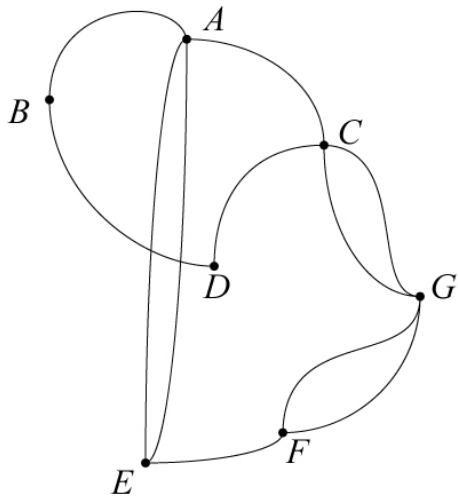
Be sure to show all unit fractions as needed.
Round only the final answer to two places as needed.

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

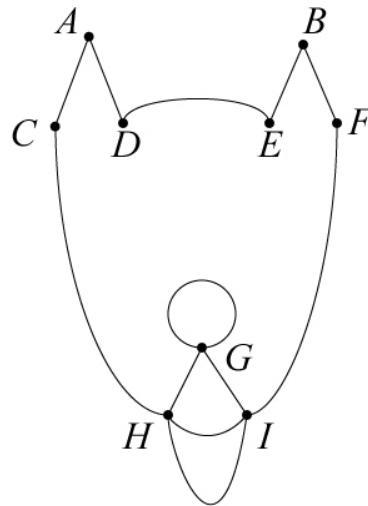


2) (8 points each) For the following graphs below, label each vertex with its degree. Also, determine if there is an Euler Circuit, Euler Path, or neither. **If there is an Euler Circuit or Euler Path, give an example of one.** If neither, explain why not:

a)



b)



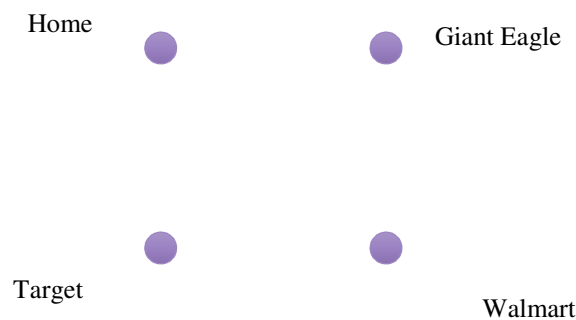
3) (3 points each) Draw a graph that meets the following requirements or explain why the graph cannot exist.

- a) A connected graph with only three even degree vertices where the total degree is 12:
 b) A graph of 5 vertices with a total degree of 11.

4) Mike needs to do some shopping the day after Christmas to buy candy to give away for next Christmas. He finds the distances between the stores that he plans on visiting. The distances are in miles:

	Home	Giant Eagle	Target	Walmart
Home	 	2.2	2.6	3.2
Giant Eagle	2.2	 	4	3.6
Target	2.6	4	 	7.6
Walmart	3.2	3.6	7.6	

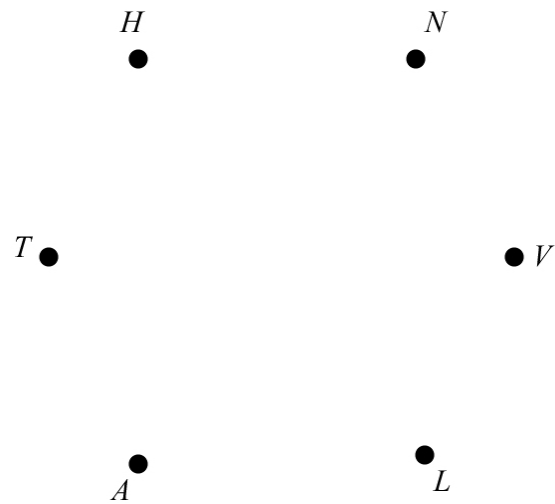
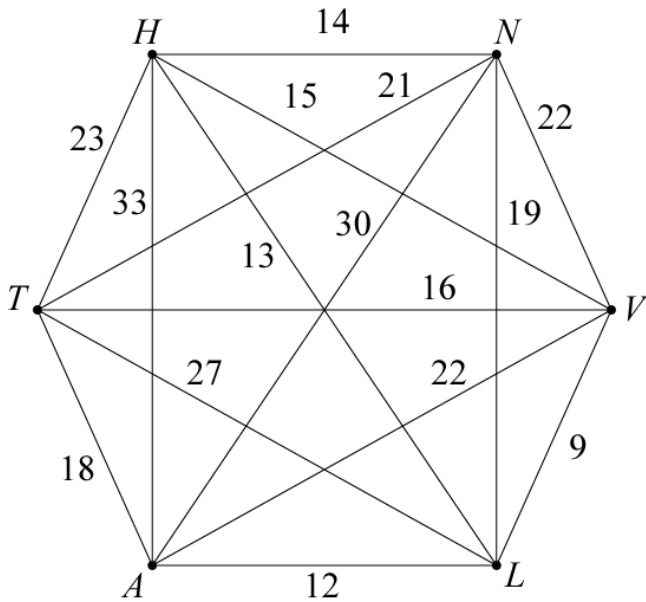
a) (3 points) Based on the information in the chart, draw a weighted graph below:



b) (7 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) (4 points) For the same graph in part a, solve the problem using the Nearest Neighbor Method:

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



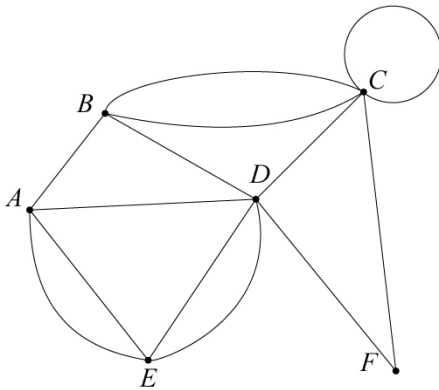
6) (2 points each) Define the following terms. Examples will not be accepted for credit:

a) Loop

b) Bridge

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* _____

8) (3 points each) Convert as directed:

a) 15 yards to feet:

b) 92 inches to centimeters:

c) 12 feet to millimeters:

d) 3.1415 km to mm:

9) (6 points) During the 2009 Berlin World Championships, Usain Bolt ran at a top speed of 12.27 meters per second. How fast is this in miles per hour?

10) (6 points) One curtain panel measures 36 inches by 78 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?

LINEAR UNITS OF MEASURE: THE ENGLISH SYSTEM

$$12 \text{ inches (in.)} = 1 \text{ foot (ft)}$$

$$3 \text{ feet} = 1 \text{ yard (yd)}$$

$$36 \text{ inches} = 1 \text{ yard}$$

$$5280 \text{ feet} = 1 \text{ mile (mi)}$$

TABLE 9.3 English and Metric Equivalents

1 inch (in.)	≈ 2.54 centimeters (cm)
1 foot (ft)	≈ 30.48 centimeters (cm)
1 yard (yd)	≈ 0.9 meter (m)
1 mile (mi)	≈ 1.6 kilometers (km)

TABLE 9.1 Commonly Used Metric Prefixes

Prefix	Symbol	Meaning
kilo	k	$1000 \times$ base unit
hecto	h	$100 \times$ base unit
deka	da	$10 \times$ base unit
deci	d	$\frac{1}{10}$ of base unit
centi	c	$\frac{1}{100}$ of base unit
milli	m	$\frac{1}{1000}$ of base unit

SQUARE UNITS OF MEASURE: THE ENGLISH SYSTEM

$$1 \text{ square foot (ft}^2\text{)} = 144 \text{ square inches (in.}^2\text{)}$$

$$1 \text{ square yard (yd}^2\text{)} = 9 \text{ square feet (ft}^2\text{)}$$

$$1 \text{ acre (a)} = 43,560 \text{ ft}^2 \text{ or } 4840 \text{ yd}^2$$

$$1 \text{ square mile (mi}^2\text{)} = 640 \text{ acres}$$

TABLE 9.4 English and Metric Equivalents for Area

1 square inch (in. ²)	≈ 6.5 square centimeters (cm ²)
1 square foot (ft ²)	≈ 0.09 square meter (m ²)
1 square yard (yd ²)	≈ 0.8 square meter (m ²)
1 square mile (mi ²)	≈ 2.6 square kilometers (km ²)
1 acre	≈ 0.4 hectare (ha)

TABLE 9.5 English Units for Capacity

2 pints (pt)	= 1 quart (qt)
4 quarts	= 1 gallon (gal)
1 gallon	= 128 ounces (oz)
1 cup (c)	= 8 ounces
Volume in Cubic Units	Capacity
1 cubic yard	about 200 gallons
1 cubic foot	about 7.48 gallons
231 cubic inches	about 1 gallon

TABLE 9.6 Units of Capacity in the Metric System

Symbol	Unit	Meaning
kL	kiloliter	1000 liters
hL	hectoliter	100 liters
daL	dekaliter	10 liters
L	liter	1 liter ≈ 1.06 quarts
dL	deciliter	0.1 liter
cL	centiliter	0.01 liter
mL	milliliter	0.001 liter

TABLE 9.9 Volume and Weight of Water in the Metric System

Volume	Capacity	Weight
1 cm ³	= 1 mL	= 1 g
1 dm ³ = 1000 cm ³	= 1 L	= 1 kg
1 m ³	= 1 kL	= 1000 kg = 1 t

TABLE 9.10 Weight: English and Metric Equivalents

1 ounce (oz)	≈ 28 grams (g)
1 pound (lb)	≈ 0.45 kilogram (kg)
1 ton (T)	≈ 0.9 tonne (t)

UNITS OF WEIGHT: THE ENGLISH SYSTEM

$$16 \text{ ounces (oz)} = 1 \text{ pound (lb)}$$

$$2000 \text{ pounds (lb)} = 1 \text{ ton (T)}$$

FROM CELSIUS TO FAHRENHEIT

$$F = \frac{9}{5}C + 32$$

FROM FAHRENHEIT TO CELSIUS

$$C = \frac{5}{9}(F - 32)$$