

**Instructions:** Show all work. Use exact answers unless specifically asked to round. Be sure to complete all parts of each problem.

1. You buy a TV for \$2000 at a simple interest of 6% for 2 years. How much money will you need to pay back at the end of the loan? (8 points)

$$2000(1 + .06(2)) = \cancel{\$} 2240$$

2. You place \$10,000 in a CD paying 2.1% interest annually. If interest is compounded weekly, how much money is in the account 5 years later? (8 points)

$$10,000 \left(1 + \frac{.021}{52}\right)^{5 \cdot 52} =$$

$$\cancel{\$} 11,106.87$$

$$\begin{aligned} N &= 260 \\ \bar{I} &= 2.1 \\ PV &= 10,000 \\ PMT &= 0 \\ FV &= 11,106.87 \\ P/Y &= CH = 52 \end{aligned}$$

3. Suppose you invest your \$100,000 retirement account balance in the stock market for ten years, earning an average return of 9% compounded continuously. How much money is in the account at the end of that time? (8 points)

$$100,000 e^{.09(10)} = \cancel{\$} 245,960.31$$

4. Find the effective rate for 3.6% compounded  
 a. Daily (4 points)

$$1 - \left(1 + \frac{.036}{365}\right)^{365} = -1.03665$$

3.67%

- b. Semi-monthly (4 points)

$$1 - \left(1 + \frac{.036}{24}\right)^{24} = -1.036627$$

3.66%

5. If you take out a mortgage of \$250,000 with a 30-year term, at 2.8% interest,  
 a. How much are your monthly payments? (8 points)

$$N = 360$$

$$I = 2.8$$

$$PV = 250,000$$

$$PMT = 1027.24$$

$$FV = 0$$

$$PY = 4Y = 12$$

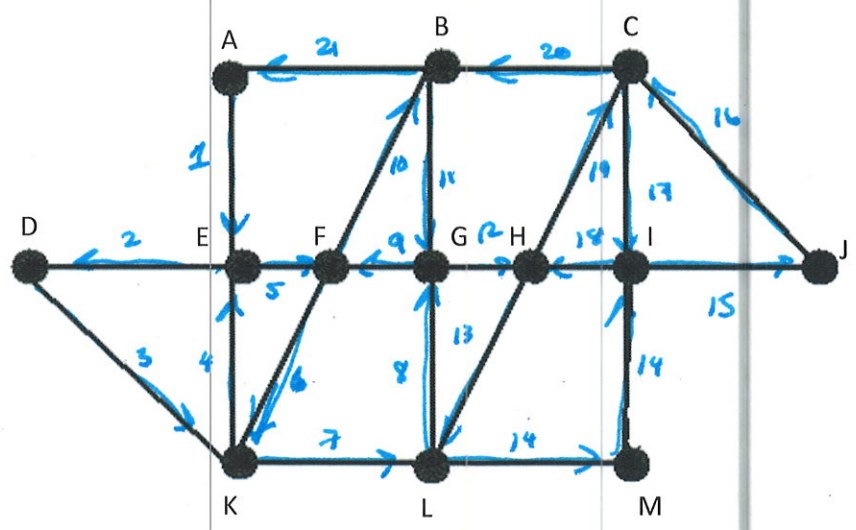
$$\$ 1027.24$$

- b. How much interest do you pay back by the time the loan is paid off? (5 points)

$$\$ 1027.24 * 360 = 369,806.40$$

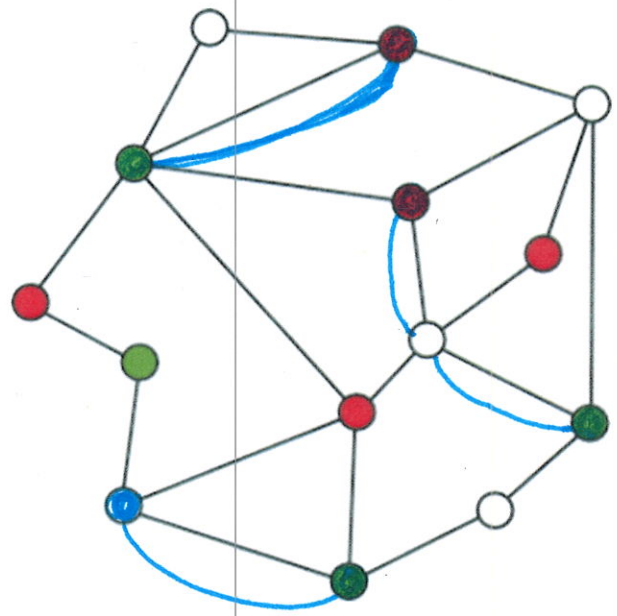
$$\begin{array}{r} 369,806.40 \\ - 250,000.00 \\ \hline \$ 119,806.40 \end{array}$$

6. Use Fleury's Algorithm on the graph below to find an Euler circuit (or path). List the vertices you travel through in order, or number the edges as you use them. (8 points)



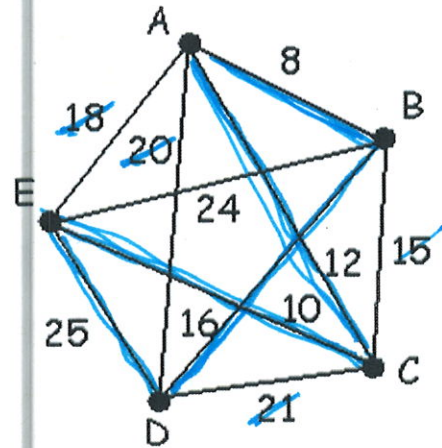
*answers will vary*

7. Eulerize the graph below. What is the minimum number of edges that might be used to eulerize this graph, and how many did you actually use? (8 points)



*6 odd vertices  
need minimum of 3  
to Eulerize  
actually need 4*

8. Use the graph to the right to find the (approx.) minimum cost Hamilton circuit by the Cheapest Link Algorithm. Clearly state the final weight of your circuit. (10 points)



$$8 + 10 + 12 + 16 + 25 = 71$$

9. Use the Nearest Neighbor Algorithm to find the (approx.) lowest cost Hamilton circuit using the table below. What is the length of the final circuit? (10 points)

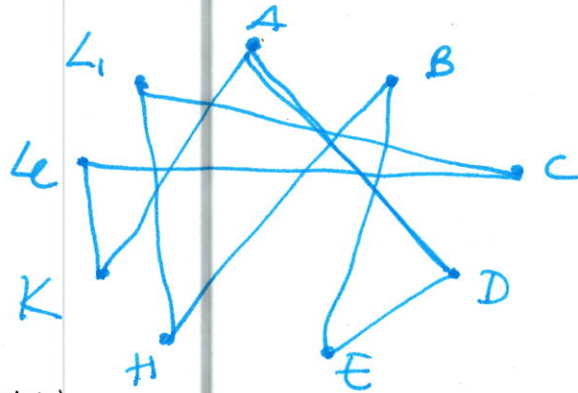
<b>Aberdeen</b>		<b>Bristol</b>		<b>Cambridge</b>		<b>Dover</b>		<b>Exeter</b>		<b>Hereford</b>		<b>Kendal</b>		<b>Leeds</b>		<b>Lincoln</b>	
513		171		124		244		128		204		72		142			
473		206		250		224		310		188		177					
595		83		153		355		294		153							
587		54		252		272		259									
482		236		147		219											
279		219		94													
328		185															
388																	

Distance in kilometres

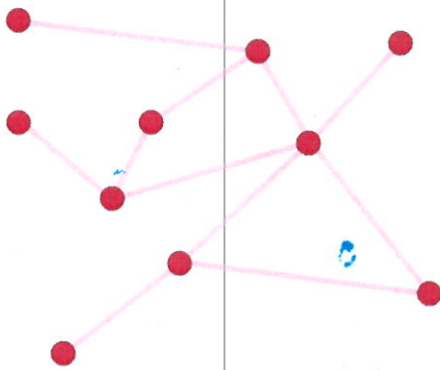
Starting Aberdeen

A K Le C Li H B E D A

$$279 + 72 + 147 + 94 + 153 + 54 + 83 + 244 + 595 = 1721$$



10. Find the redundancy of the graph below. (5 points)



10 vertices  
 9 needed for tree (edges)  
 11 edges in graph  
 (2 circuits)

$$11 - 9 = 2$$

redundancy is 2