2nd Semester Extra Credit Assignment

Requirements/Expectiations:

1) **You must print the packet(s) yourself.**

2) **All problems must be completed or I will not grade it.**

3) **Problems will be checked for ACCURACY. Any packet that has more than 20% of the problems wrong will not be given credit.**

4) **You must complete the work yourself and SHOW YOUR WORK.**

5) I will not answer questions about problems from the packet before May 19th. (What this means: If you do not want to stay for "Senior Jail", you need to use other resources to help you complete the packet. This includes your classmates, the internet, etc.)

*****Packets that meet the above requirements and expectations will result in replacement of up to 10 practice grades per semester being replaced with 100%.***

DUE DATE: Packets are due on May 18th if you do not want to stay for Senior Jail. If you do not turn them in by May 18th you MUST come to Senior Jail to complete the packets. I will not accept packets after May 18th from students that do not come to Senior Jail.

I have read and understand the requirements and expectations listed above. I understand that whether these requirements have been met is at the sole discretion of Ms. Hajduk and that not meeting these expectations and requirements may result in receiving no extra credit.

_____ _____ _____

Print Name Signature Date

**PLEASE ATTACH SEPARATE SHEETS OF PAPER WITH YOUR WORK.

For the following sequences, determine if they are arithmetic, geometric, or neither (FIRST BLANK). Then identify the common difference or common ratio if they are arithmetic or geometric (SECOND BLANK). Use proper notation (r/d)!

1. 100, 10, 1, 1/10, …

   _____

   _____

2. 1, 1, 1, 1, …

   _____

   _____

3. 4, 2, 0, -2, …

   _____

   _____

Given the first term in the sequence and the common ratio or common difference, find the FIRST FOUR TERMS (FIRST BLANK). Then write the RECURSIVE FORMULA for the sequence (SECOND BLANK).

4. $a_1 = 3$; $d = -4$

   _____, _____, _____, _____

   _____

5. $a_1 = -5$; $d = -2$

   _____, _____, _____, _____

   _____

6. $a_1 = 3$; $r = -2$

   _____ ,_____, _____, _____

   _____

Given the recursive formula and the first term, write the FIRST FOUR TERMS of each sequence.

7. $a_n = a_{n-1} + 1$; $a_1 = 4$

   _____, _____, _____, _____

8. $a_n = a_{n-1} * 1/2$; $a_1 = 24$

   _____, _____, _____, _____

9. $a_n = a_{n-1} - 3$; $a_1 = 25$

   _____, _____, _____, _____

Given the explicit formula find the FIRST THREE TERMS and the 7th term (LAST BLANK).

10. $a_n = -2n - 5$

    ____, ____, ____, … ____

11. $a_n = 3 * 2^{n-1}$

    ____, ____, ____, … ____

12. $a_n = 6 - n$

    ____, ____, ____, … ____

Write the explicit formulas for the following sequences.

13. 4, 8, 16, …

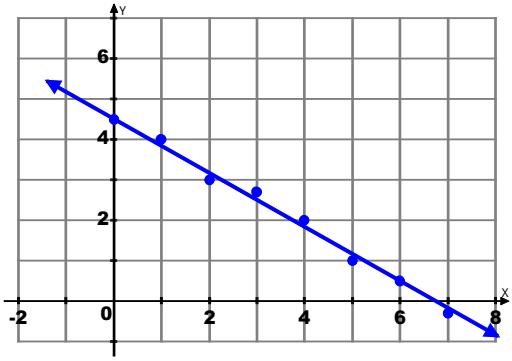
14. -2, -4, -6, …

15. 5, 10, 15, …

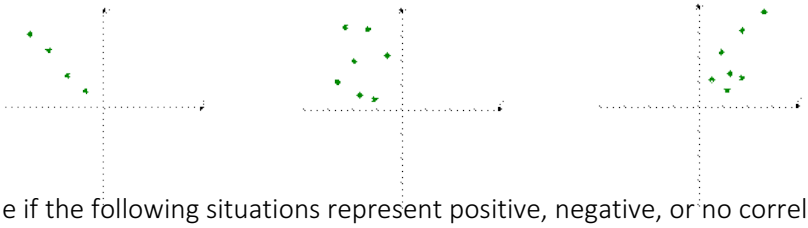
16. John and Bill both want to buy the same motorbike (cost is $2000). Each one saves his money. They record their total savings at the end of each month and notices that their total savings forms a sequence. How many months must pass before John has saved enough money to buy the bike? _____ How many months must pass before Bill has saved enough money to buy the bike? _____ Who will get the bike?_____

Name	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7
John's Total Savings	$0.25	$0.50	$1	$2	$4	$8	
Bill's Total Savings	$50	$100	$150	$200	$250	$300	

17. For the given scatter plot, find the equation for the line of best fit by hand.



18. Estimate the correlation coefficient for the following graphs.



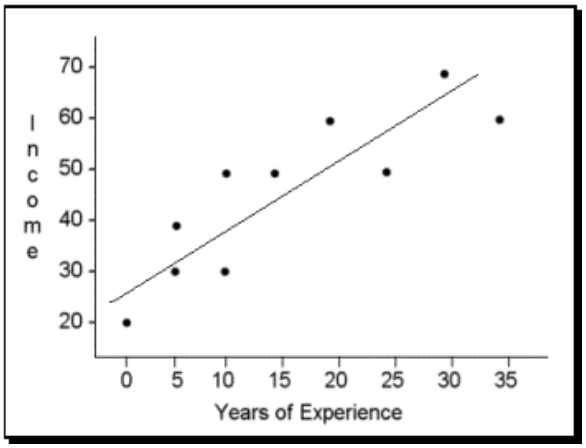
19. Determine if the following situations represent positive, negative, or no correlation.

a) Number of hours studying for the SAT and your score. _____

b) The distance you drive and the number of stars in the sky. _____

c) The temperature and the length of daylight hours for the day _____

Use the scatterplot below to answer questions 20-24.



20. Write the equation of the line of best fit.

21. What is the slope and what does it represent in the context of the problem?

22. What is the y-intercept and what does it represent in the context of the problem?

23. Using the equation you wrote, how much money would you expect someone to make if they have 20 years experience? Is this interpolation or exprapolation? Explain.

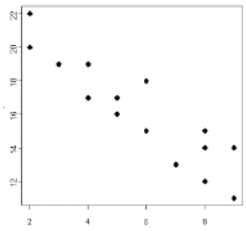
24. Using the equation you wrote, if a person's income is $85,000, how many years of experience would you expect them to have? Is this interpolation or extrapolation? Explain.

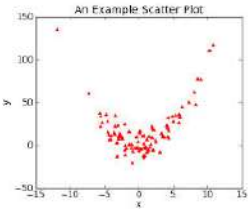
25. Put the following correlation coefficients in order from strongest to weakest: -.75, .23, -.099, .81, -.95, .9, -.544

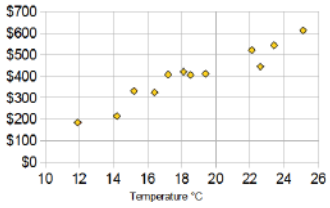
26. Write the equation of the line given the following information:

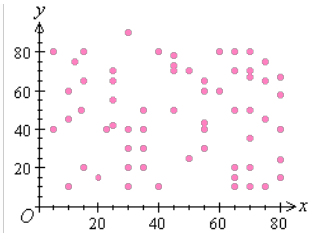
a. Two points on the line (-2, 6) and (1, 5) b. A point on the line (-2, -2) and the slope m= -3

27. Describe the relationship as linear or non-linear. If linear, does it have a positive or negative relationship? Draw in an accurate line of best fit for any of the scatterplots that have a linear correlation.









28. The following data was collected. Determine if a linear, quadratic, or cubic function would best model the data and explain why. If none of these, state that and why.

a. Data Table D: Temperature vs. Volume Data for a Gas Sample

Temperature (°C)	Volume of Gas (mL)
20	60
40	65
60	70
80	75
100	80
120	85

b.

Ticket Price (dollars)	*Profit (Millions of Dollars)*
200	3.08
250	3.52
300	3.76
350	3.82
400	3.70
450	3.38

c.

x	y
1	-10
2	-9
3	-6
4	0
5	11
6	29
7	56
8	93

d.

x	y
5	-7
10	5
15	2
20	-3
25	8
30	1
35	-1
40	3

29. Express each as a percent:

a) $\frac{4}{5}$ b) $\frac{1}{8}$ c) $\frac{3}{4}$

30. Express each as a percent:

a) 0.72 b) 0.0035 c) 4.756

31. Express each as a decimal:

a) 65% b) 99.7% c) 150% d) 3% e) .65%

32. What is 8% of 120?

33. Suppose the local sales tax rate is 6% and you purchase a backpack for $24.

a. How much tax is paid? b. What is the television's sales price?

34. A television with an original price of $850 is on sale at 35% off.

a. What is the discount amount? b. What is the television's sale price?

35. A college that had 40 students for each lecture course increased the number to 45 students. What is the percent increase in the number of students in a lecture course?

36. A dictionary regularly sells for $56.00. The sale price is $36.40. Find the percent decrease of the sale price from regular price.

For 37-40 find the simple interest.

	Principal	**Rate**	**Time**
37.	$6000	3%	1 year
38.	$8400	5%	6 years
39.	$20,000	8%	9 months
40.	$36,000	15%	60 days

41. Suppose you have $14,000 to invest. Which investment yields the greater return over 10 years: 7% compounded monthly or 6.85% compounded continuously? How much more (to the nearest dollar) is yielded by the better investment?

42. How much money should parents deposit today in an account that earns 7% compounded monthly so that it will accumulate to $100,000 in 18 years for their child's college education?

43. How much money should be deposited today in an account that earns 5% compounded quarterly so that it will accumulate to $75,000 in 35 years for retirement?

44. You deposit $2000 in an account that pays 6% interest compounded quarterly.

a. what is the value after 1 year? b. what is the value after 5 years?

45. What is the value of an account after 7 years that has an interest rate of 6.5% compounding weekly if you initially deposit $6750?

46. Which investment is the better choice: 6.25% compounded monthly or 6.3% compounded annually?

47. How much interest is earned after 10 years on an account whose principal is $10,500 and where interest is compounded continuously at a rate of 7.5%?

48. A new TV costs $2300. If you can afford a down payment of $300 and monthly payments of $50, how long will it take you to pay for the TV?

49. A car dealership requires a 15% down payment on a car that costs $23,000. If they also require that the car be paid off in 3 years, what would be the monthly payments?

50. Geri wants $30,000 at the end of five years in order to pay for new siding on her house. If her bank pays 2.2% interest compounded annually, how much does she have to deposit each year in order to have that amount?

51. Kate wants to install an in ground pool in three years. She estimates the cost will be $75,000. How much should she deposit monthly into an account that pays 5.2% interest compounded monthly in order to have enough money to pay for the pool in 3 years?

52. Sylvia wants to go on a cruise around the world in 6 years. If she puts $100 into an account each week that pays 1.25% interest compounded weekly, how much will she have at the end of the five-year period?

53. Anton opened an account at Bradley Bank by depositing $10,250. The account pays 2.35% interest compounded monthly. He deposits $1,000 every month for the next ten years. How much will he have in the account at the end of the two-year period?

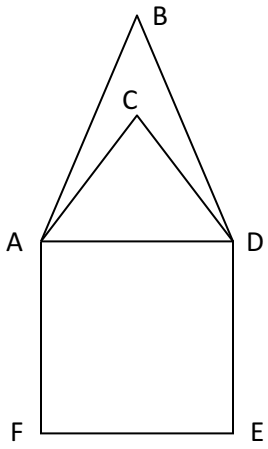
54. Provide a definition of the following:

a. Euler path
b. Euler circuit
c. Hamiltonian path
d. Hamiltonian circuit
e. cycle

56. How can you quickly tell if a graph has an Euler circuit, an Euler path, or is not traceable?

57.

a. Name an Euler circuit for the graph provided.



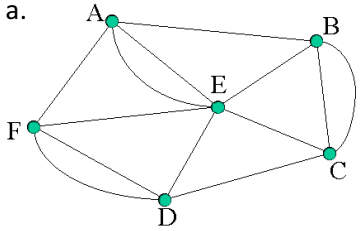
b. Decide if the following path creates an Euler circuit.
Explain why or why not.

A→B→E→F→B→C→D→F→E→D

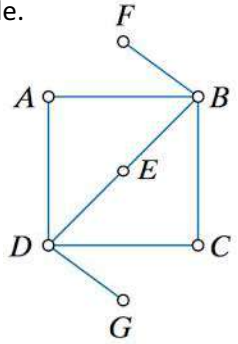
c. Decide if the path above creates an Euler path.
Explain why or why not.

58. For each of the following graphs, describe an Euler circuit. If a circuit is not possible, decide if there can be an Euler path or if the graph is not traceable.

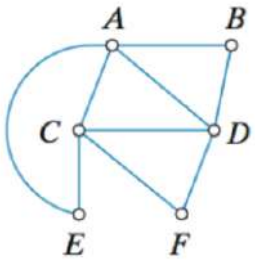
a.



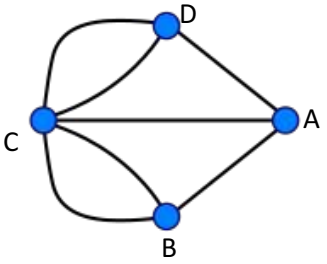
b.



c.

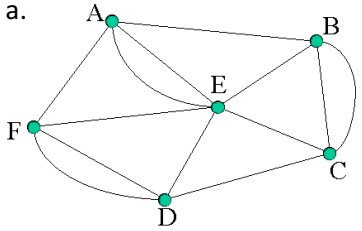


d.

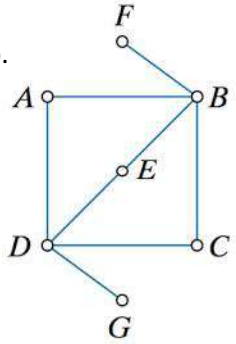


59. For each of the following graphs, describe a Hamiltonian circuit. If a circuit is not possible, describe a Hamiltonian path.

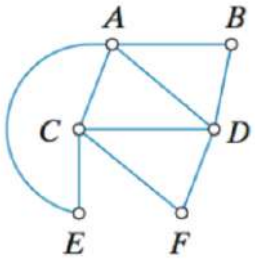
a.



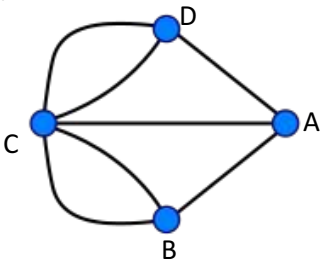
b.



c.



d.

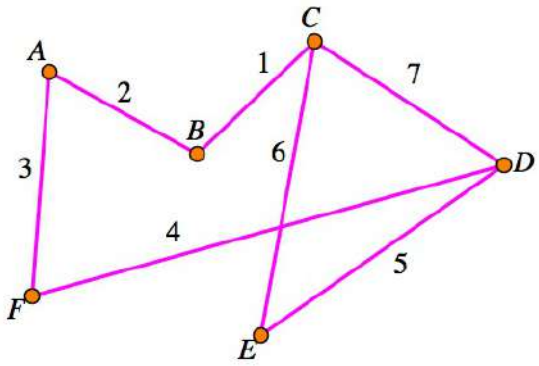


60.

a. Use extra paths to create a graph that contains an Euler circuit.

b. Describe a circuit for the graph.

c. If the numbers represent time between paths in a park, how long would it take to walk the circuit you described?

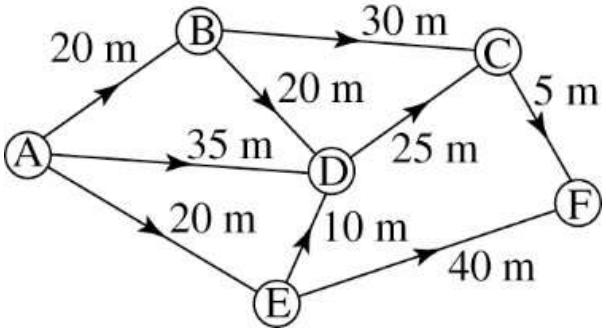


61. The network shown in the figure at right shows the time, in minutes, taken to travel between stations.

a. What do the vertices represent?

b. What do the edges represent?

c. What is the shortest time taken to travel from A to F?

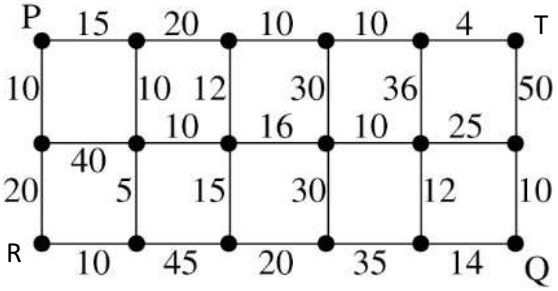


62.

a. What is the shortest path from P to Q?

b. What is the shortest path from R to T?

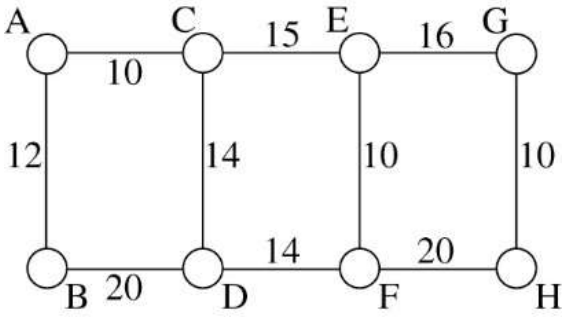
c. What is the shortest path from R to Q?



63.

a. Give the minimal spanning tree for this network.

b. What is the length of the minimal spanning tree?



64. The table at right shows the cost, in thousands of dollars, Of networking a number of offices at a large complex.

a. Draw a network to represent this information.

b. Identifying the minimal spanning tree and calculate the minimum cost of connecting these offices.

	A	B	C	D	E	F
A		13	25	30		10
B			20		30	
C						
D					10	
E						15
F						

65. Six towns are connected by roads and the distance between them, in kilometers, is shown in the table.

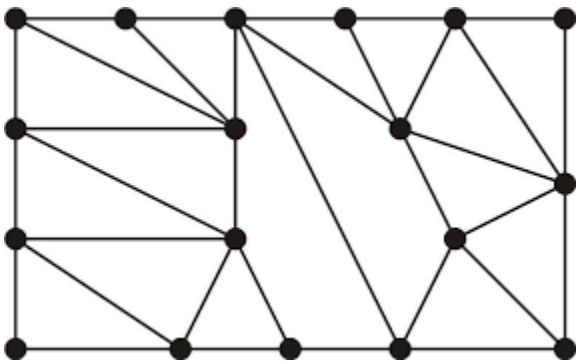
a. Draw a network to represent this information.

b. Identifying the minimal spanning tree from P to U and calculate the minimum distance.

	P	Q	R	S	T	U
P		30	10			
Q			15	5	8	
R				20	5	
S					10	10
T						30
U						

66. Color the following maps so that no two adjacent regions are given the same color.

a.



b.