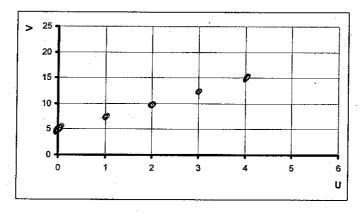
1. (8 points) Consider the relationship expressed in the table below.

Δυ	U	V] AV
ار	0	5	325
14,	1	7.5	
12	2	10	2.5
12	3	12.5	22-5
, <	4	15]>2.5
, j			



- a. Plot the data points using the grid provided above.
- b. Use the space below to explain and show how to determine a functional equation for the relationship between the values of V and U.

my slope =
$$\frac{3}{2}u = 2.5$$

My intercept 3 5

W= 2.5U+5

c. Show how to use your functional equation to find the value of V when U = 10.

$$U=10 \implies V=(2.5)(10)+5$$

$$V=30$$

d. Show how to use your functional equation to find the value of U when V = 45.

$$V=45 \implies 45 = 2.5 U + 5$$

 $40 = 2.5 U$
 $U = 16$

2. (8 points) Consider the relationship expressed in the table below. Assume the observed pattern of differences continues indefinitely.

M	n	Cn	1 SC	80C
	0	2)	18)	1
17	1.	10	5147	9
14	2	24	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	6.
12	3	44	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	6
,<	4	70	1261	
12	5	102	1327	6

a. Complete the table by entering the values for
$$C_0$$
 and C_5 .

b. Complete the following rule that specifies a difference equation for the relationship.

$$C_0 = 2$$

$$C_n = C_{n-1} + 6N + 2$$

c. Complete the following rule to specify an explicit functional equation for this relationship.

$$2a=6 \Rightarrow 4=3$$

$$4+b=8 \Rightarrow b=5$$

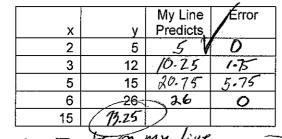
$$C=2$$

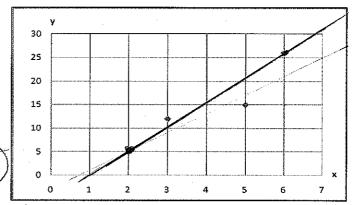
$$C_n = 30^2 + 50 + 2$$

(8 points) Some data values are plotted on the graph below. Sketch a line that you think provides a pretty good fit to the data.

ONE POSSIBLE SOLUTION

- Show how to find an equation for the line you drew. Write out that equation.
- Comment on how well your line fits the data by finding you average absolute error. b.
- Show how to use your equation to estimate a predicted value for y when x = 15.





5.25x-5.5

My Ave Erron = 7875

4. (8 points) Suppose B_t denotes the number of bacteria (in thousands) in a culture after t hours of growth, and suppose the relationship between B, and t is given in the following table.

t	0	1	2	3	4	
B _t	250	/350	490	686	(960.4)	
Notice		\checkmark	\leq		7	
124,05		1.4	"4	14 1	1.4	

- a. Complete the table by predicting how many thousands of bacteria will be present in the culture after 4 hours of growth.
- b. Complete the following rule that specifies a difference equation for the relationship.

$$V_{B_0} = \frac{250}{B_{t-1}} \times 1.4$$

c. Complete the following rule to specify an explicit functional equation for this relationship.

$$B_t = 250 (1.4)^t VVV$$

- 5. (8 points) The deposits at M&M Bank grew from \$100 million in 1999 to \$200 million in 2004. Assume that the deposits grew at a constant (linear) rate. In the following state your conclusions using complete sentences.
 - a. Calculate the average rate of change in millions of dollars per year from 1999 to 2004.

1999 - t V(t) in \$ millions AV(t) = 100 = 20

100 > 100

The rote of change per year.

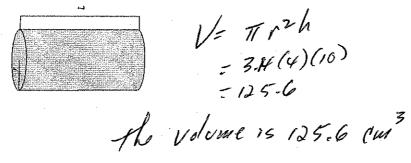
b. Let the number of years since 1999 be denoted by t, so t = 0 corresponds to the year 1999. Let V(t) denote the value of the deposits t years after 1999. Write a rule, in terms of t, that can be used to predict the future value of deposits after the year 1999.

V(+) = 20t +100

b. Calculate V(10) and explain its meaning.

V(10) = 20(10) +160 = 360 In 10 years after 1999, in 2009, the deposits in M&M Book will be \$300 million.

6. (5 points) Consider the cylinder illustrated below. Determine the volume of the cylinder to the nearest 0.1 cm³ assuming the radius of the base is 2 cm and the height is 10 cm.



(5 points) Determine the surface area of the pyramid illustrated below to the nearest 1 cm².

One of the triangular faces looks like 50, Surforc area in cur is 4(2.6.5) + 62 6 cm or 96 cm2 6 cm