FINAL EXAM , FORM A   NAME:

MTE 301:

1. Identify the function as linear, quadratic, or exponential. Also, find the equation for the function.

(5 points each part – for a total of 30 points)

a.

x	y
0	1
1	5
2	11
3	19
4	29
5	41
6	55
7	71

Type of function:

Equation:

b.

x	y
0	100
1	200
2	400
3	800
4	1600
5	3200
6	6400
7	12800

Type of function:

Equation:

c.

x	y
0	0
1	3
2	6
3	9
4	12
5	15
6	18
7	21

Type of function:

Equation:

2. (10 points) a. Write an equation to express the relationship between the number of tiles ($\square$) and the figure number.
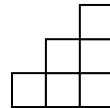
Figure 1	Figure 2	Figure 3

(5 points) b. Use your equation from part a to find the number of tiles in the 24th figure.

3. Describe how you can recognize quadratic functions in:

(5 points) a. tables

(5 points) b. graphs

(5 points)c. equations

4. In the quadratic equation: $y = ax^2 + bx + c$ how do the following changes affect the appearance of the graph?

(5 points) a. Changing the a

(5 points) b. Changing the b

(5 points) c. Changing the c

5. Describe how you can recognize exponential functions in a - c:

(5 points) a. graphs

(5 points) b. tables

(5 points) c. equations

(5 points) d. Exponential functions are what type of sequence?

6. (4 points each table) The tables below represent exponential functions. For each function, fill in the missing values in the table and write the equation that represents the function.

x	y
0	4
2	1.44
4	0.5184
6	0.186624
8	0.06718464
10	0.02418647
12	
14	

x	y
1	
2	
3	64
4	256
5	1024
6	4096
7	16384
8	65536

(2 points)Which represent exponential growth? Which represents exponential decay?

7. Suppose you invest $500 into a savings account that pays a yearly interest rate of 4%.

(5 points) a. Write an equation for an exponential function giving the balance in the account as a function of time since the initial investment.

(5 points) b. Use your equation in part a to determine how long it will take for the account to reach $740.

(5 points) c. Use your equation in part a to determine how much money will be in the savings account after 25 years.

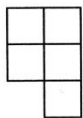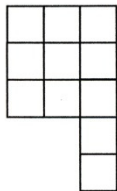8. Here are the first three figures in a growing pattern.
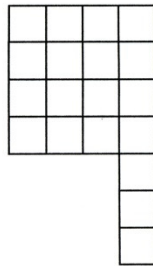

Figure 1   Figure 2   Figure 3

(5 points) Write an **explicit** rule for finding the **perimeter** of the nth figure in the pattern.

(5 points) Write a **recursive** rule for finding the **perimeter** of the nth figure in the pattern.

(5 points) Write an **explicit** rule for finding the **area** of the nth figure in the pattern.

9. (5 points) Can Courtney enlarge a 3 inch by 5 inch photograph proportionally to a 4 inch by 6 inch photograph? Is this possible? Why?

10. (10 points) Model how to use Algebra Tiles to multiply the following binomials. Also state the product.

$(x + 3)(3x - 2)$