MATH 119 TEST 1 ***(Sample B)*** NAME:
Class ID #:

1) Each of the function in the following table is increasing or decreasing in different way. Which of the graphs below best fits each function

Graph A Graph B Graph C Graph D

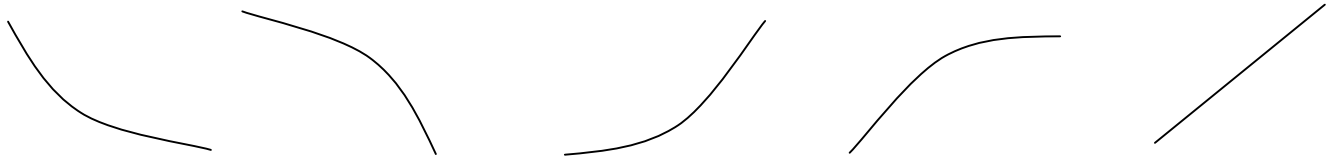
t	***g*(*t*)**	***h*(*t*)**	***k*(*t*)**	***f*(*t*)**
1	20	30	20	30
2	22	26	30	22
3	26	20	38	16
4	32	12	44	12
5	40	2	48	9
Graph				

2) Determine whether each of the following tables of values could correspond to a linear function or exponential function, or neither. If it is linear or exponential, find the formula for the function and then find it at $t = 10$.

t	***g*(*t*)**	***h*(*t*)**	***k*(*t*)**
0	12	20	20
1	10	19	22
2	8	18.05	24.2
3	6	17.1475	26.62
Formula			
Estimate each at *t* =10			

3) Given the following functions, find the graph that best represnts each function:

function	$P = P_\circ(1.02)^t$	$P = P_\circ(0.97)^t$	$P = P_\circ + 20t$
Best represented by Graph			



Graph A Graph B Graph C Graph D Graph E

4) Suppose a town has a population of 10,000. Fill in the values of the population in the table if:
   a) each year, the town's population grows at a rate of 500 people per year.
   b) each year, the town's population grows at a rate of 5% per year.

Year	**0**	**1**	**2**	**3**
Population grows at a rate of 500 per yr.	10,000			
Population grows at a rate of 5% per yr.	10,000			

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5) The price P of an item increased from \$6,000 in 1970 to \$9,000 in 1990. Let t be the number of years since 1970 (i.e. $t = 0$ corresponds to the year 1970).
   a) Find the equation for P assuming that the increase in price has been linear.

   b) Find the equation for P assuming the increase in price has been exponential. [Hint: use $P = P_0 a^t$ and find the value of a]

   c) Fill in the following table

t	**Price P (Linear Growth)**	**Price P (Exponential Growth)**
0	\$6,000	\$6,000
20		
30		

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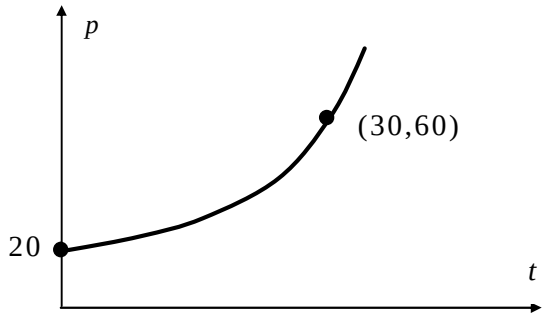
6) Give a possible formula for the following function:



7) The total cost C of producing q units of a certain item is tabulated below :

Total cost: C	20	25	30	35
Number of units produced: q	0	2	4	6

a) What is the fixed cost?

b) Find the linear equation which expresses the total cost C as a function of q.

c) Find the total cost for producing $q = 10$ units.

d) Find the linear equation which expresses q as a function of the total cost C. [Solve for q using the equation you obtained in part b.]

e) How many units can be produced at a total cost of $40?

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8) A certain hand-held calculator is being sold by the manufacturer at a price of $90 per unit. The fixed cost for production is $120,000 and each unit costs $30 to make. Let q be the number of units sold.

a) Write the following:

revenue function $R(q)$:

cost function $C(q)$:

profit function $P(q)$:

b) How many units the manufacturer needs to sell to break even?

9) A movie theater owner found that when the price for a ticket was $25, the average number of customers per night was 500. When the price was reduced to $20, the average number of customers went up to 650.

a) Find the formula for the demand function, assuming that it is linear

b) Find the number of customers when the price is $5

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10) One of the following tables represents supply curve and the other represents demand curve:

q	10	22	35	45
p	5	10	15	20

q	40	32	25	15
p	5	10	15	20

a) At a price of $10, how many items would the consumers purchase? _____

b) At a price of $10, how many items would the manufactures supply? _____

c) Will the market push the prices higher or lower than $10? Why?

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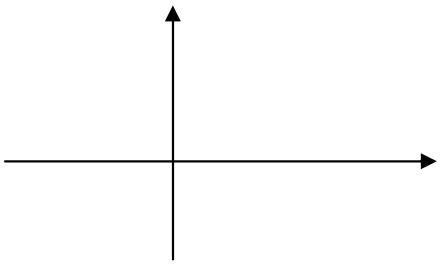
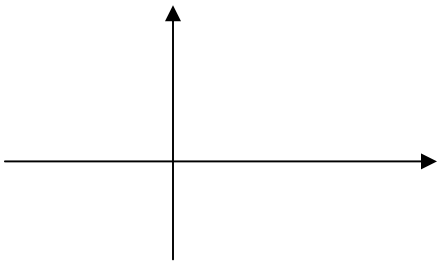
11) Draw a possible graph for the following functions *(just show the shape of the graph):*

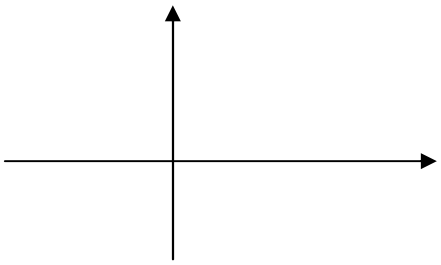
a) $s(t) = mt - 4$ where $m > 0$



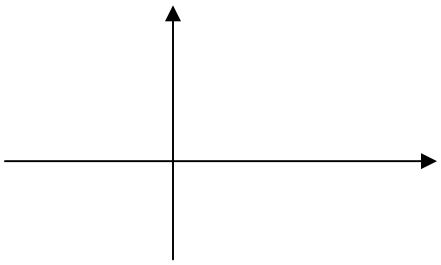
b) $s(t) = mt + 4$ where $m < 0$



c) $s(t) = 5(a)^t$ where $a > 1$



d) $s(t) = 3(a)^t$ where $a < 1$



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12. Solve for t for each of the following equations *(you must show your work)*:

a) $5e^{3t} = 8e^{2t}$

b) $6(5^t) = 8(2^t)$

c) $\ln t = 2$

d) $\ln(3t - 1) - \ln(2t + 1) = 0$

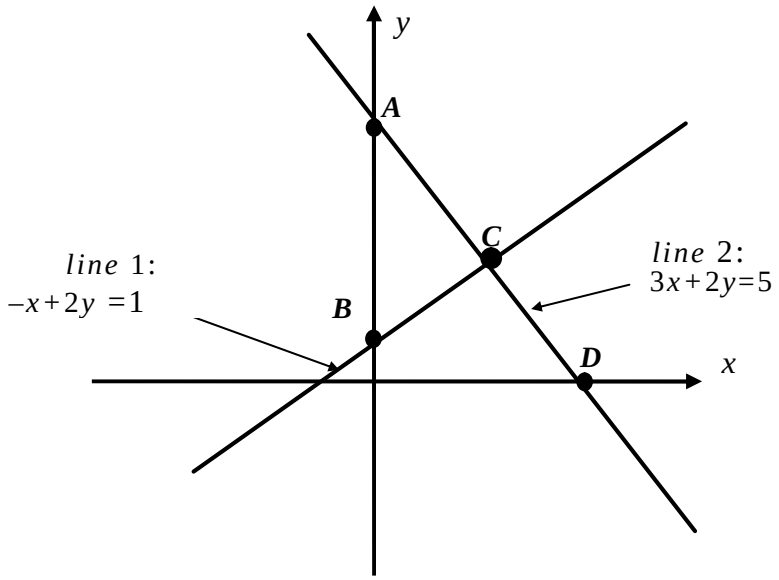
Algebra Review Problems:

1. Solve for x: $\dfrac{1}{x-2} = \dfrac{2}{x+4} + \dfrac{2x-1}{x^2+2x-8}$

2. Solve by any method: $4x + y = -1$ and $x - 2y = 11$

3. Solve for x (use the quadratic formula): $x^2 + 4x + 1 = 0$

4. After a 20% reduction, a refrigerator is on sale at \$480. What was the original price?



5. Using information provided in the above figure, find the coordinates of point:

Pont A:	*Point B:*
Point C:	*Point D:*