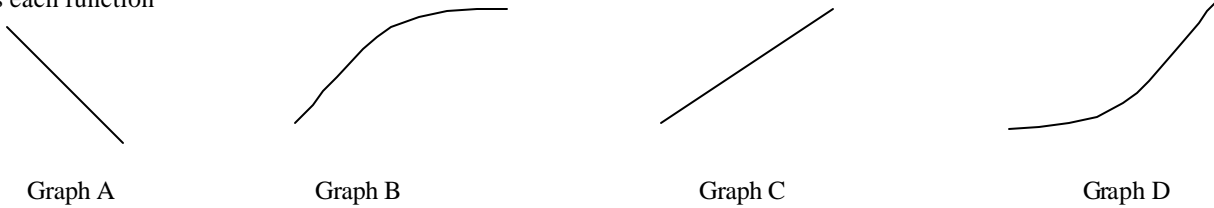1) Each of the function in the following table is increasing or decreasing in different way. Which of the graphs below best fits each function

Graph A   Graph B   Graph C   Graph D

t	$g(t)$	$h(t)$	$k(t)$	$f(t)$
1	20	2	25	12
2	30	4	23	22
3	42	6	21	30
4	58	8	19	35
5	75	10	17	37
Graph	*D*	*C*	*A*	*B*

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 define it as: Increasing, Decreasing, Growing, or Decaying.

t	$g(t)$	$h(t)$	$k(t)$
0	12	10	30
1	9	14	25.5
2	6	19.6	21.675
3	3	27.44	18.42375
Function Type: Exponential, Linear or Neither	*linear*	*Exp.*	*Exp.*
Increase, Decrease Decay, Growth?	*Decrease*	*Growth*	*Decay.*
Formula	*y = -3t + 12*	*h = 10(1.4)^t*	*k = 30(0.85)^t*
Estimate each at t =10	*-18*	*289.25*	*5.906*

3) A $ 30,000 truck has a resale value of $10,000 ten years after it was purchased.

    1) Find the formula of the value of the truck as a function of time

    2) Sketch a graph of the value

    3) When will the value of the truck be $0?

1) V = -2000t + 30,000

3) t = 15 years
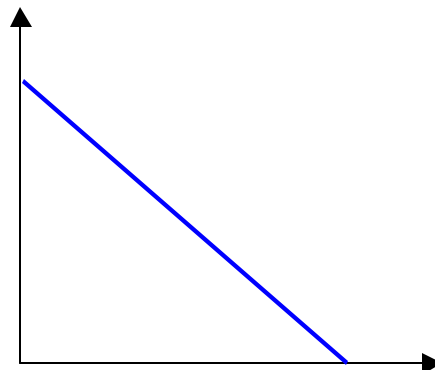
4) Suppose a town has a population of 2000. Fill in the values of the population in the table if:
   a) each year, the town has an absolute growth of 50 people per year.
   b) each year, the town has a relative growth of 10% per year.

Year	0	1	2	3
Population (absolute rate of 50)	2000	*2050*	*2100*	*2150*
Population (relative rate of 10%)	2000	*2200*	*2420*	*2662*

5) Assume that the price of an airline ticket rose from 200 in 1970 to 400 in 1990 *(20 years later)*. Let t be the number of years since 1970.
   a) Find the equation if the increase in the price has been linear

$$P = 10t + 200$$

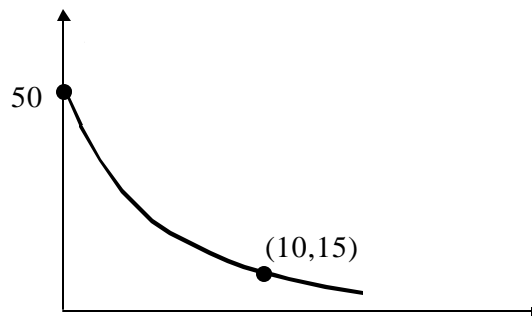   b) Find the equation if the price has been exponential (use $P = P_0 a^t$ and find the value of a)

$$P = 200(1.035)^t$$

   c) Fill the following table

t	Linear Growth price	Exponential Growth price
0	200	200
20	400	400
30	*500*	*565.68*

6) Give a possible formula for the following function:

$$P = 50.(0887)^t$$

50

(10,15)

7) According to a survey, the number of people *(N)* attending concerts in an arena is given in the following table:

Price *(P)*	10	15	20	25
Number of people *(N)*	200	150	100	50

   a) Find the linear equation which gives the price as a function of number of people *(price depends on number of people)*

   P = -0.1N + 30

   b) Find the linear equation which gives the number of people as a function of price *(number of people depends on price)*

   N = -10P + 300

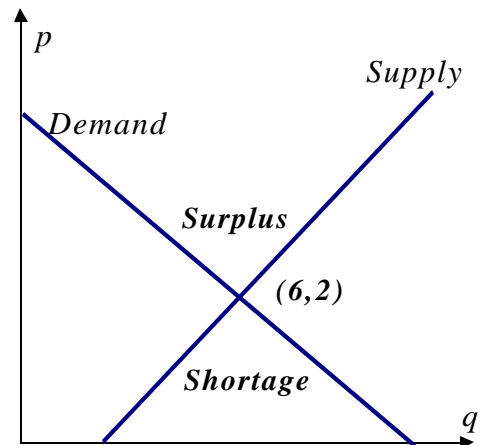8) Suppose that the demand and Supply function for a product is given by:
$$q = -p + 8 \qquad \text{and} \qquad q = 2p + 2$$
where p is the unit price in $ of the product.

   a) Find the equilibrium point and the quantity of the product

   p = $2 and q = 6 units

   b) graph the two functions, **lable** the demand and supply function and **show** the shortage and surplus area

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9) Solve for t for each of the following equations (you must show your work):
   a) $3e^{4t} = 2e^{2t}$

   t = -0.2027

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b) $5(3^t) = 2(6^t)$

   t = 1.3219

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c) $ln(t - 1) = 0$

   t = 2

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

   $$t = \frac{1}{\sqrt{2}}$$

Algebra Review Problems:

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1. Solve for x: $\quad \dfrac{2}{x^2 - 1} - \dfrac{2}{x+1} = \dfrac{-1}{1-x}$
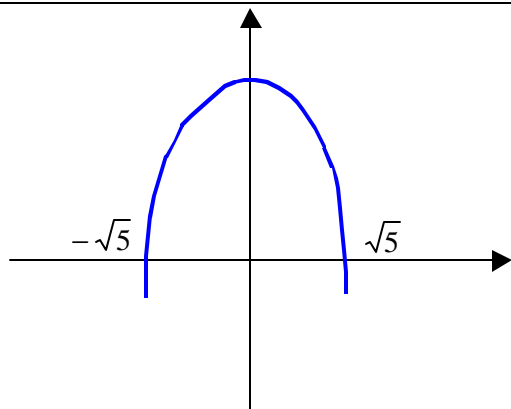
   $x = 1$ then there is No Solution

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2. Solve for x (use the quadratic formula): $x^2 - 8x = -10$

$$x = 4 \pm \sqrt{6}$$

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3. Graph the following function: $y = 5 - x^2$

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4. Find the x-intercept for: $\quad y = -x^2 + x + 20$

   (-4 , 0) & (5 , 0)

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5. Match the graphs with the equations:

   a) $y = 0.5x + 2$ is best represented by line: …***D***..

   b) $y = x - 4$ is best represented by line: …***B***…..

   c) $y = -0.7x + 3$ is best represented by line: …***A***…..

   d) $y = -x - 4$ is best represented by line: …***C***…..