

# Calculus BC

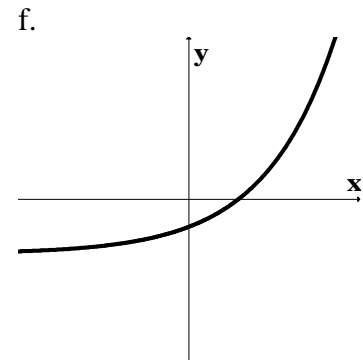
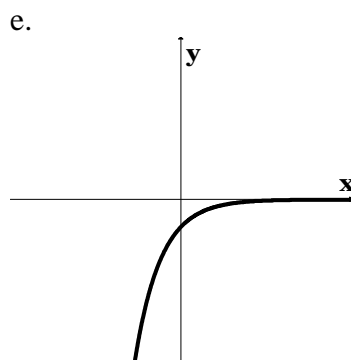
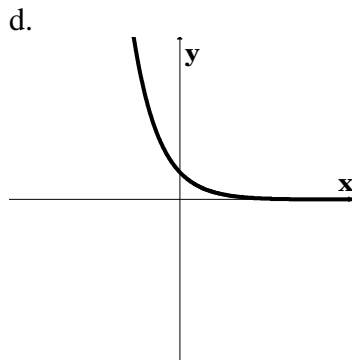
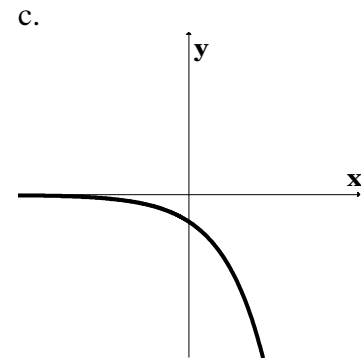
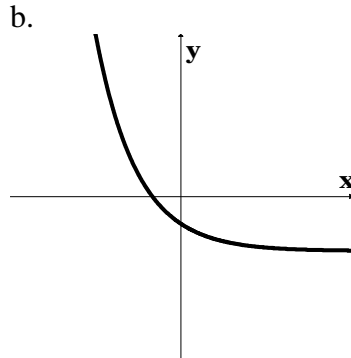
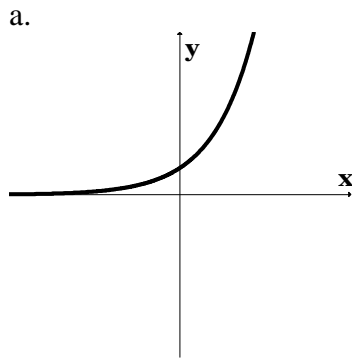
## Summer Assignment 3

### from Kennedy book

pg 24 1-8, 12, 13, 15, 16, 20, 21, 24, 25, 33, 34, 36, 37, 38, and 0,

In problems 1-6 match the graph with the equation. Do not use your calculators graphing feature.

- |                     |                    |
|---------------------|--------------------|
| 1. $y = 2^x$        | 2. $y = 3^{-x}$    |
| 3. $y = -3^{-x}$    | 4. $y = -0.5^{-x}$ |
| 5. $y = 2^{-x} - 2$ | 6. $y = 1.5^x - 2$ |



- |  |                |
|--|----------------|
| 7. Graph the function then state its domain and range.   | $y = -2^x + 3$ |
| 8. Graph the function then state its domain and range.   | $y = e^x + 3$  |
| 12. Rewrite the exponential expression with a base of 2. | $16^{3x}$      |
| 13. Rewrite the exponential expression with a base of 2. | $(1/8)^{2x}$   |
| 15. Use a graphing calculator to solve $2^x = 5$         |                |
| 16. Use a graphing calculator to solve $e^x = 4$         |                |

- 20 Complete the table for the function.

$$y = -3x + 4$$

x	y	change in y
1		
2		
3		
4		

21. Complete the table for the function.

$$y = x^2$$

x	y	change in y
1		
2		
3		
4		

24. The population of Silver Run in 1890 was 6250. Assume the population increased at a rate of 2.75% per year. a) Estimate the population in 1915 and 1940. b) Approximately when did the population reach 50,000?
25. The half life of phosphorus-32 is about 14 days. There are 6.6 grams present initially.  
a) Express the amount of phosphorus-32 remaining as a function of time  $t$ .  
b) When will there be 1 gram remaining.
33. Suppose a colony of bacterial starts with 1 bacterium and doubles in number every half hour. How many bacteria will the colony contain at the end of 24 hours.
34. Suppose that in any given year the number of cases of a disease is reduced by 20%. If there are 10,000 cases today, how many years will it take to:  
a) Reduce the number of cases to 1000?  
b) to eliminate the disease (reduce the number of cases to less than 1).
36. The number of bacteria in a petri dish culture after  $t$  hours is  $B = 100e^{0.693t}$   
a) What is the initial number of bacteria present?  
b) How many bacteria are present after 6 hours?  
c) Approximately when will the number of bacteria be 200? Estimate the doubling time of the bacteria.

37. The table gives some data about the population of Mexico..

Year	Population (millions)
1950	25.8
1960	34.9
1970	48.2
1980	66.8
1990	81.1

- a) Let  $x = 0$  represent 1900,  $x = 1$  represent 1901 and so forth. Find an exponential regression equation and superimpose its graph on a scatter plot of the data.
- b) Use the regression equation to estimate the population of Mexico in 1900. How close is it to the actual population in 1900 of 13,607,272?
- c) Use the exponential growth equation to estimate the annual rate of growth of the population in Mexico.