

# Calculus BC

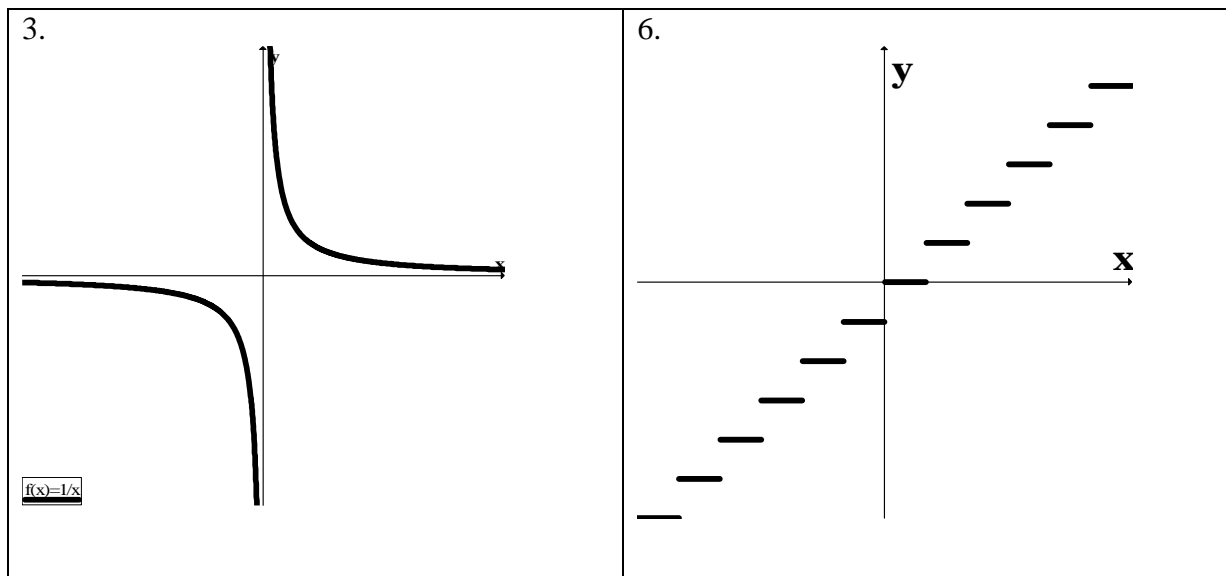
## Summer Assignment 4

### from Kennedy book

pg 39 3, 6, 7, 9, 12, 15, 17, 18, 19, 21, 24, 33, 34, 36, 38, 41, 42, 46, 48, 49

A function is one to one on a domain if  $f(a) \neq f(b)$  whenever  $a \neq b$ . In plain English, a function is one to one if the y values do not repeat for different x values.

In problems 3, and 6 determine if the function is one-to-one



In problems 7-12 determine if the function has an inverse. Use your calculator to see if the function passes the horizontal line test. The horizontal line test is like the vertical line test but it tells us if a function's inverse is a function.

7.  $y = \frac{3}{x-2} - 1$

9.  $y = x^3 - 4x + 6$

12.  $y = 2^{3-x}$

In problems 15-24 find  $f^{-1}(x)$  and verify that  $(f(f^{-1}(x))) = f^{-1}(f(x)) = x$  or in the other notation  $(f \circ f^{-1})(x) = (f^{-1} \circ f)(x) = x$

15.  $f(x) = x^3 - 1$

18.  $f(x) = x^{2/3}, x \geq 0$

21.  $f(x) = \frac{1}{x^2}$

24.  $f(x) = \frac{x+3}{x-2}$

In problems 33-36 draw the graph and determine the domain and range of the function.

33.  $y = 2\ln(3 - x) - 4$

34.  $y = -3\log(x + 2) + 1$

36.  $y = \log_3(x - 4)$

38. Solve the problem algebraically and support your answer graphically.

$$e^{0.05t} = 3$$

41. Solve for y in terms of t.

$$\ln y = 2t + 4$$

42. Solve for y in terms of x. (hint: use the fact that  $\ln(a/b) = \ln a - \ln b$ )

$$\ln(y - 1) - \ln 2 = x - \ln x$$

46. The half life of a certain radioactive substance is 12 hours . There are 8 grams initially.

a. Express the amount of substance as a function of time t.

b. When will there be 1 gram remaining?

48. The population of Glenbrook is 375,000 and is increasing at the rate of 2.25% per year. Predict when the population will be a million.

49. Find the natural logarithm regression equation for the data in the table.

Year	Metric tons (millions)
1960	61.09
1970	176.85
1990	321.93

a) Estimate the number of metric tons of oil produced by Saudi Arabia in 1975

b) Predict when Saudi Arabian oil production will reach 400 million metric tons.