Objectives of Test 3   MA099 Intermediate Algebra

1)   Solve Linear Equations:
      A) With 1 equation & 1 unknown
            Review:
      Solve the equations for the unknowns
      a) 3x + 17 = 26   b) 12(a + 3) - 36 =2a + 18

      B) With 2 Equations and 2 Unknown, Review page 251 Numbers 13, 15, 16, 18

      2)   When solving 2 equations with 2 unknowns, state clearly your
      understanding of what it means when results are "pathological" or "haywire."
      (What happens when the variables disappear from the solved equations and 5 =
      5 or 12 = 20? How should we state the conclusion in the above situations?).
      Review page 253 Numbers 4, 5, 7, 9, and 21

3)   Use TEXT Section 3.8 concepts to solve Cost, Revenue Problems
      Review: Review page 254, Numbers 28, and 30

4)   Use algebra concepts to solve for specific variables in formulae and solve for
      given values of unknown variables in formulae.
      Review: Given the formula for the area of parallelogram,

$$A = \frac{1}{2}h(s_1 - s_2)$$

      Where, A is the area of the parallelogram, h is the height of the parallelogram,
      and s_1 and s_2 are the sides of the parallelogram.

            a) Solve the formula for s_1. b) If $A = 126$ sq in, $h = 14$ in, and $s_2 = 10$,
            what is s_1

5)   a) Describe the domain and range of linear, exponential and logarithmic
      functions using <, >, ≤,≥ OR interval notation.
      Review: Pages 762 -- 764, Problems 1 thru 75 Odds.
      b) Determine if exponential functions are growth or decay functions
      c) Given the growth or decay factor, determine growth or decay rate
      d) Given the growth or decay rate, determine growth or decay factor

6)   Use equations, tables, or graphs of linear, logarithmic or exponential functions to evaluate the functions and inverse function at given values of the independent or dependent variable.

   Review: Given the graph below, find f(4), f(0), f(2), $f^{-1}(2)$, $f^{-1}(3)$, $f^{-1}(10)$
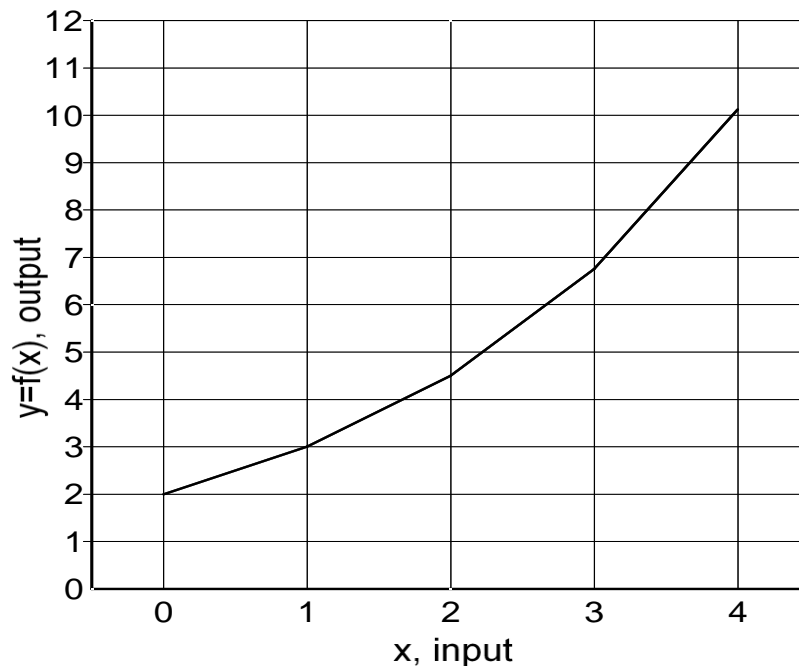
7)   Determine inverse functions for linear, exponential, and logarithmic functions.
Review HW: Find the inverse functions of the following functions:

a) y = f(x) = 2x + 3   aa) $y = \frac{1}{2}x - 3$ b) y = f(x) = 3^x

c) y = f(x) = $\left(\frac{1}{4}\right)^x$ d) y = f(x) = 5^x e) y = f(x) = $\log_5 x$

f) y = f(x) = $\log_{10} x$ f) f(x) = y = $\log_3 x$ g) y = f(x) = ln x

h) y = f(x) = ½x + 7

8)   Solve exponential and logarithmic equations.

Log Equations
a) $10 - 2\log_{0.5} x = 4.36$
b) -3 + 2•ln(x) = 7
c) $2\log_b 24 - 10 = 6.45$

9) Exponential Equations

a) $7e^{2x+10} = 100$

b) $4e^{3x+} = 68$

c) $60 + 2 \bullet 5^{x+1} = 310$

10) Determine exponential functions from tables of values -that is, given a table of values like the 2 below, for an exponential function, determine a & b and write the function in correct function notation.

A) Determine the following for the exponential data in the table.

x, input	-4	-1	2	4	5	6
y = f(x), output	1.43	2.8	5.47	8.55	10.68	13.35

a) Is it a growth or decay function b) the y-intercept (initial value),
c) the growth or decay factor
d) the growth or decay rate
e) What is the function?

B) Determine the following for the exponential data in the table.
a) Is it a growth or decay function.

x, input	-2	-1	0	1	2	3
y = f(x), output	2.08	1.76	1.5	1.275	1.08	0.92

b) the y-intercept (initial value),
c) the growth or decay factor
d) the growth or decay rate
e) What is the function?

11) Use exponential functions to model given situations (Initial Value Problems).
Review HW: A bacteria strain is reduced using a chemical. When treated with a certain chemical, the strain of the bacteria decreases in number by 8% per day.

a) If there are 200,000 bacteria at the beginning of the experiment, what is the exponential function to model the number of bacteria after treatment with the chemical? (What is the initial value, a, the y-intercept? What is the decay factor?)
b) What is the number of bacteria after 10 days, after 20 days?
c) When will the number of bacterial be 50,000?

12) Given exponential functions or using ones you determined, determine values of f(x) for given values of x and determine values of x for given values of f(x) (Using logs).

13) Write log equations in exponential form and write exponential equations in log form.

14) Review HW: Write $\log_3 27 = 3$ in exponential form and write $2^4 = 16$ in log form.