Math 111: College Algebra   (4-0-4)   11/01/09

Catalogue Description: Study of functions including graphs, operations and inverses. Includes polynomial, rational, exponential, logarithmic functions and their applications, and systems of equations.

Course Objectives: After completing this course, students will be able to

1. Demonstrate competence with functions and their operations.

2. Solve non-linear algebraic equations and transcendental equations involving logarithms and exponentials.

3. Graphically represent functions and transformations.

4. Model real world phenomena with functions.

5. Communicate mathematical ideas using correct and appropriate notation.

Learning Outcomes and Performance Criteria

1. Apply mathematical concepts and principles to perform computations.
   Core Criteria:

   (a) Solve an equation containing rational, exponential or logarithmic expressions.
   (b) Complete the square to solve an equation or to put an equation into a standard form.
   (c) Give the domain of a function whose equation is given.
   (d) Compute and simplify the composition function of two functions.
   (e) Compute the inverse of a function that is a direct composition of other functions.
   (f) Given the factored form of a polynomial function, give the roots of the function. Given the roots of a polynomial function and one additional point that is not a root, give the factored form of the function.
   (g) Give the equations of the vertical and horizontal asymptotes of a rational function whose equation is given.
   (h) Use properties of logarithms to
      i. write a single logarithm as a linear combination of logarithms
      ii. write a linear combination of logarithms as a single logarithm

   Additional Criteria:

   (i) Solve a general quadratic480.3223.71TDn.quation

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(o) Find and simplify a difference quotient.

(p) Give the range of a function whose equation is given.

(q) Given the vertex of a parabola and one other point on the parabola, give the equation of the parabola.

(r) Change an exponential equation into logarithm form and vice-versa.

2. Create, use and analyze graphical representations of mathematical relationships.

Core Criteria:

(a) Recognize the graphs of $y = \sqrt{x}$, $|x|$

(b) Create a quadratic model for a given situation.

(c) Solve a problem using a given exponential model.

(d) Solve a problem using a given logarithmic model.

(e) Create an exponential model for a given situation.

Additional Criteria:

(f) Solve a problem that is modeled by a system of linear equations.

(g) Determine a half-life or doubling time from given information.