BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MTH 1310 Pre-Calculus

5 Semester Hours

Student Learning Outcomes and Enabling Objectives

1. Analyze equations, inequalities, and functions.
    a. Perform the complete set of operations, including composition, with functions.
    b. Graph functions.
    c. Identify the inverse of a function algebraically and graphically.
    d. Determine the domain and range of a function.
2. Evaluate polynomial functions.
    a. Graph polynomial functions.
    b. Solve quadratic equations by means of completing the square, the square root property, and the quadratic formula.
    c. Apply quadratic and polynomial functions to real-world situations.
    d. Identify zeros, points of intersection, extreme values, and function values, using the graphing and table functions of a graphing utility.
3. Evaluate radical functions.
    a. Perform the complete set of operations with radical expressions and complex numbers.
    b. Graph radical functions.
    c. Convert between radical and exponential form.
    d. Apply radical expressions to real-world situations.
4. Evaluate rational functions.
    a. Graph rational functions.
    b. Solve rational inequalities.
    c. Identify the vertical, horizontal, and oblique asymptotes of a rational function.
5. Evaluate exponential and logarithmic functions.
    a. Perform the basic operations on exponential and logarithmic functions.
    b. Convert between logarithmic and exponential forms.
    c. Apply the change-of-base formula to transform logarithmic functions.
    d. Solve equations involving logarithmic functions.
    e. Graph exponential and logarithmic functions.
    f. Apply exponential and logarithmic functions to real-world situations.
6. Analyze conic sections.
    a. Recognize standard forms of conic sections.
    b. Graph conic sections.
    c. Apply conic sections to real-world situations.

7. Evaluate trigonometric functions.
    a. Define trigonometric functions of any angle based on a right triangle or the unit circle.
    b. Solve problems using the Pythagorean Theorem, distance formula, and special right triangles.
    c. Graph trigonometric functions.
    d. Solve equations using trigonometric identities and inverse trigonometric functions.
    e. Solve problems using the Law of Sines and Law of Cosines.
    f. Convert between degree and radian measure.
    g. Apply radian measures to angles.
    h. Apply polar and rectangular analysis to solve problems.
    i. Apply vector solutions to problems.
    j. Determine the period, amplitude, and phase shift of a sinusoidal function.

8. Analyze sequences and series.
    a. Find the first several terms of a sequence.
    b. Write the terms of a sequence defined by a recursive formula.
    c. Find the formula for an arithmetic sequence.
    d. Find the formula for a geometric sequence.
    e. Calculate sums, properly using summation notation.
    f. Determine whether a geometric sum converges or diverges.

9. Explore the elementary concepts of limits.
    a. Evaluate the difference quotient for functions.
    b. Find a limit using a table or a graph.
    c. Find the limit of a sum, difference, product, and quotient.
    d. Find the limit of a polynomial, power or root.

Big Ideas and Essential Questions

Big Ideas

- Functions
- Trigonometry
- Arithmetic and Geometric Sequences and Series
- Limits of Functions

Essential Questions

1. How does mathematics help me analyze critically?
2. How do algebra and trigonometry help me graph functions?
3. How can graphs help me better understand functions?
4. How can trigonometry help me describe functions?

These SLOs are not approved for experiential credit.
Effective: Fall 2017