

# MATHEMATICS

## *General Mathematics, Geometry, and an Introduction to Differential Calculus*

- I. GENERAL MATHEMATICS 25%
  - A. Simple and Compound Interest
  - B. Basic Counting
    - 1. The Multiplication Principle
    - 2. Permutations and Combinations
  - C. Probability of Equally Likely Events and Binomial Distribution
  
- II. GEOMETRY 65%
  - A. Right Triangles
    - 1. Pythagorean Theorem
    - 2. Special Right Triangles
  - B. Coordinate Geometry
    - 1. The Midpoint Formula
    - 2. Slope
    - 3. The Distance Formula
    - 4. Parallel and Perpendicular Lines
    - 5. Properties of Quadrilaterals in the  $x$ - $y$  Coordinate Plane
  - C. Plane and Solid Figures
    - 1. Area and Properties of Polygons
    - 2. Surface Areas and Volumes of Three-Dimensional Figures
      - a. Prisms
      - b. Cylinders
      - c. Pyramids
      - d. Cones
      - e. Spheres
    - 3. Properties of Similar Figures
    - 4. Circles
      - a. Area
      - b. Angle Measures in Circles
      - c. Lengths of Tangents, Secants, and Intersecting Chords

III. INTRODUCTION TO DIFFERENTIAL CALCULUS 10%

- A. Average Rate of Change of Basic Polynomial Functions
- B. Basic Limits and Continuity
- C. First Derivative of Basic Polynomial Functions and Graphical Interpretation
- D. Equations of Tangent Lines