

Advanced Math  
Fourth Nine Weeks

Number, Number Sense and Operations
<b>11 A/B2.</b> Determine what properties hold for vector addition and multiplication, and for scalar multiplication.
<b>11 B5.</b> Model, using the coordinate plane, vector addition and scalar multiplication.
<b>11 D9.</b> Use vector addition and scalar multiplication to solve problems.
<b>12 C2.</b> Apply combinations as a method to create coefficients for the Binomial Theorem, and make connections to everyday and workplace problem situations.

Measurement
<b>12 D1.</b> Solve problems involving derived measurements; e.g., acceleration and pressure.
<b>12 D2.</b> Use radian measures in the solution of problems involving angular velocity and acceleration.
<b>12 C3.</b> Apply informal concepts of successive approximation, upper and lower bounds, and limits in measurement situations; e.g., measurement of some quantities, such as volume of a cone, can be determined by sequences of increasingly accurate approximations.

Geometry and Spatial Sense
<b>11 A4.</b> Use trigonometric relationships to determine lengths and angle measures; i.e., Law of Sines and Law of Cosines.
<b>11 B2.</b> Represent translations using vectors.
<b>11 B3.</b> Describe multiplication of a vector and a scalar graphically and algebraically, and apply to problem situations.
<b>11 E5.</b> Identify, sketch and classify the cross sections of three-dimensional objects.
<b>12 B1.</b> Use matrices to represent translations, reflections, rotations, dilations and their compositions.
<b>12 A2.</b> Derive and apply the basic trigonometric identities; i.e., angle addition, angle subtraction and double angle.
<b>12 H3.</b> Relate graphical and algebraic representations of lines, simple curves and conic sections.
<b>12 H4.</b> Recognize and compare specific shapes and properties in multiple geometries; e.g., plane, spherical and hyperbolic.

Patterns, Functions and Algebra
<b>11 C1.</b> Identify and describe problem situations involving an iterative process that can be represented as a recursive function; e.g., compound interest.
<b>11 A4.</b> Identify the maximum and minimum points of polynomial, rational and trigonometric functions graphically and with technology.
<b>11 D7.</b> Model and solve problems with matrices and vectors.
<b>11 D9.</b> Solve 3 by 3 systems of linear equations by elimination and using technology, and interpret graphically what the solution means (a point, line, plane, or no solution).
<b>11 A10.</b> Describe the characteristics of the graphs of conic sections.
<b>12 A1.</b> Analyze the behavior of arithmetic and geometric sequences and series as the number of terms increases.
<b>12 A2.</b> Translate between the numeric and symbolic form of a sequence or series.
<b>12 A6.</b> Make arguments about mathematical properties using mathematical induction.
<b>12 A7.</b> Make mathematical arguments using the concepts of limit.
<b>12 A10.</b> Compare estimates of the area under a curve over a bounded interval by partitioning the region with rectangles; e.g., make successive estimates using progressively smaller rectangles.
<b>12 C8.</b> Use the concept of limit to find instantaneous rate of change for a point on a graph as the slope of a tangent at a point.

Data Analysis and Probability
<b>12 C1.</b> Identify and use various sampling methods (voluntary response, convenience sample, random sample, stratified random sample, census) in a study.
<b>12 A2.</b> Transform bivariate data so it can be modeled by a function; e.g., use logarithms to allow nonlinear relationship to be modeled by linear function.
<b>12 B3.</b> Describe the shape and find all summary statistics for a set of univariate data, and describe how a linear transformation affects shape, center and spread.
<b>12 A4.</b> Apply the concept of a random variable to generate and interpret probability distributions, including binomial, normal and uniform.
<b>12 C5.</b> Use sampling distributions as the basis for informal inference.
<b>12 D6.</b> Use theoretical or experimental probability, including simulations, to determine probabilities in real-world problem situations involving uncertainty, such as mutually exclusive events, complementary events, and conditional probability.