

*Students will be able to:* NUMBER SENSE AND OPERATIONS

- Define complex numbers and be able to perform operations on them.
- Simplify numerical expressions with powers and roots, including fractional and negative exponents.

*Students will be able to:* PATTERNS, RELATIONS, AND ALGEBRA

- Describe, complete, extend, analyze, generalize, and create a wide variety of patterns including iterative and recursive patterns such as Pascal's Triangle.
- Identify and use arithmetic and geometric sequences and series to solve problems.
- Demonstrate an understanding of the binomial theorem and use it to solve problems.
- Demonstrate an understanding of trigonometric, exponential and logarithmic functions and use them to solve problems.
- Perform operations on functions and their inverses.
- Recognize function families in graphical, table and equation form.
- Use symbolic, numeric, and graphical methods to solve quadratic, polynomial, rational, absolute value, exponential, logarithmic and trigonometric equations and inequalities.
- Use symbolic, numeric, and graphical methods to solve systems of equations and/or inequalities involving algebraic, exponential, and logarithmic expressions.
- Solve everyday application problems that can be modeled using polynomial, rational, exponential, logarithmic, trigonometric, and step functions, absolute values, and square roots.
- Recognize and use the relationship between the geometric concept of slope and the numeric concept of speed to solve problems.
- Analyze transformations on various function families both numerically and graphically.

*Students will be able to:* GEOMETRY

- Define and apply basic trigonometry to the solution of problems.
- Define and apply trigonometric identities and laws to simplify trigonometric expressions.
- Relate geometric and algebraic representations of lines, curves and conic sections.
- Apply geometric properties of lines, angles and circles to problem solving.

*Students will be able to:* MEASUREMENT

- Describe and use the relationship between radian and degree measure and use radian measure in the solution of problems involving angular velocity and acceleration.
- Use dimensional analysis for unit conversion and to confirm that expressions make sense.

*Students will be able to:* DATA ANALYSIS, STATISTICS, AND PROBABILITY

- Design surveys and apply random sampling techniques to avoid bias in the data collection.
- Select an appropriate graphical representation for a set of data and use appropriate statistics to communicate information about the data.
- Apply regression results and curve fitting to make predictions from data.
- Apply uniform, normal, and binomial distributions to the solutions of problems.
- Describe a set of data by spread, center, shape and other characteristics.
- Use combinatorics and probability to solve problems.
- Compare the results of simulations with predicted probabilities.