

Course Objective Outline

Algebra I

TIER ONE OBJECTIVES

Data & Probability

- Discuss the difference between qualitative and quantitative data
- Demonstrate and create the various visual representations of data
- Translate from one visual display to another

- Define and calculate mean, median & mode
- Define and calculate range, quartiles, and interquartile range
- Give examples of outliers and demonstrate their effect on the mean, median, mode and range values

- Compare & contrast sets of data in various representations
- Use data from visual displays for computation

- Demonstrate counting techniques and basic probability
- Differentiate between probability & odds

Functions

- Define function, domain, and range
- Demonstrate the various representations of a function - and how a relation can fail to be a function. Discuss dependent and independent variables
- Demonstrate and use function notation. Evaluate simple function rules at integer values.

- Recognize and graph with technology constant ($y = c$), linear ($y = ax + c$) and quadratic ($y = ax^2 + c$) functions
- Discuss the effect of changing a and c in the functions above
- Discuss the effect of changing the graphic scale

Coordinate Geometry

- Plot points on a number line and in the coordinate plane
- Find the distance between two points on a number line
- Use the pythagorean formula to derive the distance formula and calculate the distance between two points
- Calculate the midpoint of a line segment in one and two dimensions
- Solve a linear equation

- Revisit the graph of a linear function. Discuss and define the slope and intercepts of the graph. Recognize the effect of scale change on the graph of the line.
- Find the slope and the y -intercept of a line given the equation in slope intercept form
- Given a graph, match it with the equation of the line.
- Find the slope of a line given two points

TIER TWO OBJECTIVES

Coordinate Geometry

- Recognize, use and translate between the point-slope, slope-intercept and standard form of a line
- Solve a linear equation and recognize that the solution is the x-intercept
- Determine algebraically whether a point lies on a line

- Describe the relationship between the slopes of parallel lines
- Describe the relationship between the slopes of perpendicular lines
- Find the equation of parallel and perpendicular lines

- Translate, set up and solve linear application problems
- Interpret information from the graph of a line

Systems of Equations

- Solve systems of linear equations in two variables by graphing using technology, substitution and linear combination
- Recognize that the solution is the point of intersection of the graphs

Polynomials

- Use the laws of exponents for integer exponents
- Memorize the squares and cubes of the integers 1 to 20

- Simplify numeric square roots by factoring
- Simplify square roots involving variables by factoring
- Estimate the size of an irrational number

- Simplify polynomials by addition & subtraction
- Multiply using monomial distribution
- Multiply two binomials (FOIL)

- Revisit the graph of $y = ax^2 + c$. Extend it to the graph of $y = ax^2 + bx + c$.
- Recognize the effect of the change of a or c has on the graph of the parabola
- Identify the vertex, the maximum or minimum, the intercepts and the line of symmetry
- Solve the quadratic by graphing

- Factor by removing the common factor and solve for x
- Factor special products and solve for x
- Factor using reverse distribution (trial & error) and solve for x

- Solve a quadratic using the quadratic formula

TIER THREE OBJECTIVES

Coordinate Geometry

- Identify and graph an inequality in one variable on a number line
- Solve and graph the solution to a linear inequality in one variable

- Solve linear inequalities in two variables by graphing
- Solve systems of linear inequalities in two variables by graphing
- Explain the relationship between the solution set and the graph of the system

- Graph absolute value equations in one variable on a number line
- Graph absolute value equations in two variables
- Solve absolute value equations of varying difficulty

Polynomials

- Multiply and simplify radicals
- Divide and simplify radicals
- Rationalize expressions with monomial radical denominators
- Introduce rational exponents

- Multiply polynomials using general distribution - particularly binomials raised to a power higher than two
- State and use the binomial distribution

- Examine the effect of scale change on the graph of a parabola
- Determine algebraically whether a point lies on the graph of a parabola
- Use parabolas as models

Data & Probability

- Calculate geometric probability
- Use probability to solve applied problems