Mathematics

N-RN.2 – Rewrite expressions involving radicals and rational exponents using the properties of exponents.

N-Q.1 – Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N-Q.2 – Define appropriate quantities for the purpose of descriptive modeling.

N-Q.3 – Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

N-CN.1 - Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.

N-CN.7 - Solve quadratic equations with real coefficients that have complex solutions.

N-CN.9 - (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

A-SSE.1 – Interpret expressions that represent a quantity in terms of its context.

1.a – Interpret parts of an expression, such as terms, factors, and coefficients.

A-SSE.3 – Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

3.a – Factor a quadratic expression to reveal the zeros of the function it defines.

A-APR.3 – Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

A-CED.2 – Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-CED.3 – Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

A-CED.4 – Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law V = IR to highlight resistance R.

A-REI.1 – Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A-REI.2 – Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

A-REI.3 – Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A-REI.4- Solve quadratic equations in one variable.

4.b – Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.

A-REI.6 – Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

A-REI.7 – Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.

F-IF.1 – Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

F-IF.5 – Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

7.b – Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

7.c – Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

8.a – Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

F-IF.9 – Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

F-BF.1 – Write a function that describes a relationship between two quantities.

1.b – Combine standard function types using arithmetic operations.

1.c – (+) Compose functions.

F-LE.1- Distinguish between situations that can be modeled with linear functions and with exponential functions.

1.a – Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

1.b – Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

1.c – Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

F-TF.1 – Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

F-TF.2 – Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

F-TF.4 – (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.

F-TF.5 – Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

F-TF.7 – (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

F-TF.9 – (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.

S-ID.1 – Represent data with plots on the real number line (dot plots, histograms, and box plots).

S-ID.6- Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

6.c – Fit a linear function for a scatter plot that suggests a linear association.

S-IC.5 – Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S-IC.6 – Evaluate reports based on data.

S-CP.4 – Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

S-MD.2 – (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.

S-MD.3 – (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.

5.b – Evaluate and compare strategies on the basis of expected values

S-MD.6 – (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).