

Mathematics (9-12)

Five Town Graduation Standards and Essential Outcomes

Mathematics Graduation Standard 1

NUMBER AND QUANTITY: Reason and model quantitatively, using properties, units, and number systems to reason and solve problems.

9-12 Essential Outcomes

- A. Extend the properties of exponents to rational exponents. (HSN.RN.A)
- B. Use the properties of rational and irrational numbers. (HSN.RN.B)
- C. Reason quantitatively and use units to solve problems. (HSN.Q.A)
- D. Perform arithmetic operations with complex numbers. (HSN.CN.A.1, 2)
- E. Solve quadratic equations with real number coefficients that have complex solutions and be able to substitute the solutions into the original equations to check them. (HSN.CN.C.7)

Common Core State Standards – Key

APR - Arithmetic with Polynomials & Rational Expressions
BF - Building Functions
C - Circles
CED - Creating Equations
CN - Complex Number System
CO - Congruence
CP - Conditional Probability & Rules of Probability
GPE - Expressing Geometric Properties with Exponents
GMD - Geometric Measurement & Dimension
HSA - High School Algebra
HSF - High School Functions
HSG - High School Geometry
HSN - High School Numbers
HSS - High School Statistics and Probability
IC - Making Inferences & Justifying Conclusions
ID - Interpreting Categorical & Quantitative Data
IF - Interpreting Functions
LE - Linear, Quadratic, & Exponential Models
MG - Modeling with Geometry
Q - Quantities
REI - Reasoning with Equations and Inequalities
RN - Real Number System
SRT - Similarity, Right Triangles, & Trigonometry
SSE - Seeing Structure in Equations

Mathematics Graduation Standard 2

ALGEBRA: Interpret, represent, and create algebraic expressions and solve algebraic sentences.

9-12 Essential Outcomes

- A. Interpret the structure of expressions. (HSA.SSE.A)
- B. Write expressions in equivalent forms to solve problems. (HSA.SSE.B)
- C. Perform arithmetic operations on polynomials. (HSA.APR.A)
- D. Understand the relationship between zeros and factors of polynomials. (HSA.APR.B)
- E. Use polynomial identities such as in factoring and the zero product property to solve problems. (HSA.APR.C.4)
- F. Rewrite rational expressions. (HSA.APR.D.6)
- G. Create equations that describe numbers or relationships. (HSA.CED.A)
- H. Understand solving equations as a process of reasoning and explain the reasoning. (HSA.REI.A)
- I. Solve equations and inequalities in one variable. (HSA.REI.B)
- J. Solve systems of equations in multiple ways. (HSA.REI.C.5-7)
- K. Represent and solve equations and inequalities graphically. (HSA.REI.D)

Mathematics Graduation Standard 3

FUNCTIONS: Interpret, analyze, construct, and evaluate linear, quadratic, and trigonometric functions.

9-12 Essential Outcomes

- A. Understand the concept of a function and use functional notation. (HSF.IF.A)

- B. Interpret functions that arise in applications in terms of the context. (HSF.IF.B)
- C. Analyze functions using different representations. (HSF.IF.C.7.A-C, E, 8-9)
- D. Build a function that models a relationship between two quantities. (HSF.BF.A.1A-B, 2)
- E. Build new functions from existing functions. (HSF.BF.B.3, 4A)
- F. Construct and compare linear, quadratic, and exponential models and solve problems. (HSF.LE.A)
- G. Interpret expressions for functions in terms of the situation they model. (HSF.LE.B)



GEOMETRY: Prove, understand, and model geometric concepts, theorems, and constructions to solve problems.



- A. Experiment with transformations in the plane. (HSG.CO.A)
- B. Understand congruence in terms of rigid motions. (HSG.CO.B)
- C. Prove geometric theorems. (HSG.CO.C)
- D. Make geometric constructions. (HSG.CO)
- E. Understand similarity in terms of similarity transformations. (HSG.SRT.A)
- F. Prove theorems involving similarity. (HSG.SRT.B)
- G. Define trigonometric ratios and solve problems involving right triangles. (HSG.SRT.C)
- H. Understand and apply theorems about circles. (HSG.C.A.1-3)
- I. Find arc lengths and areas of sectors of circles. (HSG.C.B)
- J. Translate between the geometric description and the equation for a conic section. (HSG.GPE.A.1, 2)
- K. Use coordinates to prove simple geometric theorems algebraically. (HSG.GPE.B)
- L. Explain volume formulas and use them to solve problems. (HSG.GMD.A.1, 3)

- M. Visualize relationships between two-dimensional and three-dimensional objects. (HSG.GMD.B.4)
- N. Apply geometric concepts in modeling situations. (HSG.MG.A)



STATISTICS AND PROBABILITY: Interpret, infer and apply statistics and probability to analyze data and reach justifiable conclusions.



- A. Summarize, represent, and interpret data on a single count or measurement variable. (HSS.ID.A)
- B. Summarize, represent, and interpret data on two categorical and quantitative variables. (HSS.ID.B)
- C. Interpret linear models. (HSS.ID.C)
- D. Understand and evaluate random processes underlying statistical experiments. (HSS.IC.A)
- E. Make inferences and justify conclusions from sample surveys, experiments, and observational studies. (HSS.IC.B)
- F. Understand independence and conditional probability and use them to interpret data. (HSS.CP.A)
- G. Use the rules of probability to compute probabilities of compound events in a uniform probability model. (HSS.CP.B.6, 7)