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Indiana Academic Standards: Mathematics (2020)

Into Algebra I

Into Geometry

Into Algebra II

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correlated to the

Indiana Academic Standards Mathematics (2020)
Algebra 1

Standard	Descriptor	Citations
Process Standards for Mathematics		
PS.1:	Make sense of problems and persevere in solving them.	This standard is covered throughout the course. Representative pages include: SE: 19–26, 61–68, 83–90, 119–126, 131–138, 175–182, 195–202, 245–252, 271–278, 309–314, 319–326, 361–368, 383–390, 439–446, 475–482, 503–510, 555–562, 605–612 TE: 19–26, 61–68, 83–90, 119–126, 131–138, 175–182, 195–202, 245–252, 271–278, 309–314, 319–326, 361–368, 383–390, 439–446, 475–482, 503–510, 555–562, 605–612
PS.2:	Reason abstractly and quantitatively.	This standard is covered throughout the course. Representative pages include: SE: 5–11, 45–52, 75–82, 95–102, 131–138, 165–174, 225–232, 239–244, 279–286, 293–300, 319–326, 383–390, 431–438, 467–474, 491–496, 535–542, 563–570, 585–592 TE: 5–11, 45–52, 75–82, 95–102, 131–138, 165–174, 225–232, 239–244, 279–286, 293–300, 319–326, 383–390, 431–438, 467–474, 491–496, 535–542, 563–570, 585–592
PS.3:	Construct viable arguments and critique the reasoning of others.	This standard is covered throughout the course. Representative pages include: SE: 5–10, 45–52, 83–90, 111–118, 147–152, 187–194, 225–232, 309–314, 319–326, 361–368, 391–398, 411–418, 431–438, 475–482, 519–526, 585–592, 613–620 TE: 5–10, 45–52, 83–90, 111–118, 147–152, 187–194, 225–232, 309–314, 319–326, 361–368, 391–398, 411–418, 431–438, 475–482, 519–526, 585–592, 613–620

Standard	Descriptor	Citations
PS.4:	Model with mathematics.	This standard is covered throughout the course. Representative pages include: SE: 37–44, 75–82, 119–126, 139–146, 195–202, 207–216, 259–266, 293–300, 319–326, 369–376, 391–398, 411–418, 431–438, 467–474, 483–490, 535–542, 571–578 TE: 37–44, 75–82, 119–126, 139–146, 195–202, 207–216, 259–266, 293–300, 319–326, 369–376, 391–398, 411–418, 431–438, 467–474, 483–490, 535–542, 571–578
PS.5:	Use appropriate tools strategically.	This standard is covered throughout the course. Representative pages include: SE: 37–44, 83–90, 95–102, 153–158, 175–182, 217–224, 253–258, 293–300, 341–348, 369–376, 399–406, 419–424, 439–446, 491–496, 535–542, 547–554, 613–620 TE: 37–44, 83–90, 95–102, 153–158, 175–182, 217–224, 253–258, 293–300, 341–348, 369–376, 399–406, 419–424, 439–446, 491–496, 535–542, 547–554, 613–620
PS.6:	Attend to precision.	This standard is covered throughout the course. Representative pages include: SE: 53–60, 75–82, 103–110, 139–146, 165–174, 195–202, 207–216, 245–252, 279–286, 309–314, 341–348, 383–390, 447–454, 483–490, 511–518, 547–545, 593–600 TE: 53–60, 75–82, 103–110, 139–146, 165–174, 195–202, 207–216, 245–252, 279–286, 309–314, 341–348, 383–390, 447–454, 483–490, 511–518, 547–545, 593–600
PS.7:	Look for and make use of structure.	This standard is covered throughout the course. Representative pages include: SE: 5–10, 31–36, 75–82, 103–110, 131–138, 165–174, 225–232, 245–252, 271–278, 369–376, 391–398, 411–418, 439–446, 467–474, 483–490, 511–518, 555–562 TE: 5–10, 31–36, 75–82, 103–110, 131–138, 165–174, 225–232, 245–252, 271–278, 369–376, 391–398, 411–418, 439–446, 467–474, 483–490, 511–518, 555–562

Standard	Descriptor	Citations
PS.8:	Look for and express regularity in repeated reasoning.	This standard is covered throughout the course. Representative pages include: SE: 45–52, 75–82, 153–158, 217–224, 279–286, 319–326, 369–376, 383–390, 431–438, 447–454, 455–462, 519–526, 563–570 TE: 45–52, 75–82, 153–158, 217–224, 279–286, 319–326, 369–376, 383–390, 431–438, 447–454, 455–462, 519–526, 563–570
Data Analysis and Statistics		
AI.DS.1	Understand statistics as a process for making inferences about a population based on a random sample from that population. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	This standard is covered in Algebra 2.
AI.DS.2	Understand that statistics and data are non-neutral and designed to serve a particular interest. Analyze the possibilities for whose interest might be served and how the representations might be misleading.	This standard is covered in Algebra 2.
AI.DS.3	Use technology to find a linear function that models a relationship between two quantitative variables to make predictions, and interpret the slope and y-intercept. Using technology, compute and interpret the correlation coefficient.	SE: 165–174, 175–182 TE: 165A–165D, 165–174, 175A–175D, 175–182
AI.DS.4	Describe the differences between correlation and causation.	SE: 165–174 TE: 165A–165D, 165–174
AI.DS.5	Summarize bivariate categorical data in two-way frequency tables. Interpret relative frequencies in the contexts of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in data.	SE: 585–592, 593–600 TE: 585A–585D, 585–592, 593A–593D, 593–600

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Standard	Descriptor	Citations
Number Systems and Expressions		
AI.NE.1	Explain the hierarchy and relationships of numbers and sets of numbers within the complex number system. Know that there is an imaginary number, *i*, such that $\sqrt{-1} = i$. Understand that the imaginary numbers along with the real numbers form the complex number system.	This standard is covered in Algebra 2.
AI.NE.2	Simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms.	SE: 11–18 TE: 11A–11D, 11–18
AI.NE.3	Simplify square roots of monomial algebraic expressions, including non-perfect squares.	SE: 11–18 TE: 11A–11D, 11–18
AI.NE.4	Factor quadratic expressions (including the difference of two squares, perfect square trinomials and other quadratic expressions).	SE: 431–438, 439–446, 447–454, 455–462 TE: 431A–431D, 431–438, 439A–439D, 439–446, 447A–447D, 447–454, 455A–455D, 455–462
AI.NE.5	Add, subtract, and multiply polynomials. Divide polynomials by monomials.	Students divide polynomials by monomials in Algebra 2. The rest of the standard is covered: SE: 391–398, 399–406, 411–418, 419–424 TE: 391A–391D, 391–398, 399A–399D, 399–406, 411A–411D, 411–418, 419A–419D, 419–424
Functions		
AI.F.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. Understand that 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. Understand the graph of f is the graph of the equation y = f(x) with points of the form (x, f(x)).	SE: 95–102, 103–110, 111–118 TE: 95A–95D, 95–102, 103A–103D, 103–110, 111A–111D, 111–118

Standard	Descriptor	Citations
AI.F.2	Evaluate functions for given elements of its domain, and interpret statements in function notation in terms of a context.	SE: 95–102, 103–110, 111–118, 119–126 TE: 95A–95D, 95–102, 103A–103D, 103–110, 111A–111D, 111–118, 119A–119D, 119–126
AI.F.3	Identify the domain and range of relations represented in tables, graphs, verbal descriptions, and equations.	SE: 103–110, 111–118, 119–126 TE: 103A–103D, 103–110, 111A–111D, 111–118, 119A–119D, 119–126
AI.F.4	Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values, Identify the independent and dependent variables.	SE: 103–110, 111–118, 119–126, 431–438, 439–446, 447–454, 455–462, 467–474, 491–496 TE: 103A–103D, 103–110, 111A–111D, 111–118, 119A–119D, 119–126, 431A–431D, 431–438, 439A–439D, 439–446, 447A–447D, 447–454, 455A–455D, 455–462, 467A–467D, 467–474, 491A–491D, 491–496
Linear Equations, Inequalities, and Functions		
AI.L.1	Represent real-world problems using linear equations and inequalities in one variable, including those with rational number coefficients and variables on both sides of the equal sign. Solve them fluently, explaining the process used and justifying the choice of a solution method.	SE: 31–36, 37–44, 45–52, 53–60 TE: 31A–31D, 31–36, 37A–37D, 37–44, 45A–45D, 45–52, 53A–53D, 53–60
AI.L.2	Solve compound linear inequalities in one variable, and represent and interpret the solution on a number line. Write a compound linear inequality given its number line representation.	SE: 61–68 TE: 61A–61D, 61–68
AI.L.3	Represent linear functions as graphs from equations (with and without technology), equations from graphs, and equations from tables and other given information (e.g., from a given point on a line and the slope of the line). Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.	Students find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line in Geometry. The rest of the standard is covered: SE: 95–102, 103–110, 111–118, 119–126 TE: 95A–95D, 95–102, 103A–103D, 103–110, 111A–111D, 111–118, 119A–119D, 119–126

Standard	Descriptor	Citations
AI.L.4	Represent real-world problems that can be modeled with a linear function using equations, graphs, and tables; translate fluently among these representations, and interpret the slope and intercepts.	SE: 95–102, 119–126 TE: 95A–95D, 95–102, 119A–119D, 119–126
AI.L.5	Translate among equivalent forms of equations for linear functions, including slope-intercept, point-slope, and standard. Recognize that different forms reveal more or less information about a given situation.	SE: 103–110, 147–152 TE: 103A–103D, 103–110, 147A–147D, 147–152
AI.L.6	Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Graph the solutions to a linear inequality in two variables as a half-plane.	SE: 53–60, 61–68 TE: 53A–53D, 53–60, 61A–61D, 61–68
AI.L.7	Solve linear and quadratic equations and formulas for a specified variable to highlight a quantity of interest, using the same reasoning as in solving equations.	SE: 45–52 TE: 45A–45D, 45–52
Systems of Linear Equations and Inequalities		
AI.SEI.1	Understand the relationship between a solution of a system of two linear equations in two variables and the graphs of the corresponding lines. Solve pairs of linear equations in two variables by graphing; approximate solutions when the coordinates of the solution are non-integer numbers.	SE: 239–244 TE: 239A–239D, 239–244
AI.SEI.2	Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions, including cases with no solution and infinitely many solutions. Solve systems of two linear equations algebraically using elimination and substitution methods.	SE: 245–252, 253–258, 259–266 TE: 245A–245D, 245–252, 253A–253D, 253–258, 259A–259D, 259–266

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Standard	Descriptor	Citations
AI.SEI.3	Write a system of two linear equations in two variables that represents a real-world problem and solve the problem with and without technology. Interpret the solution and determine whether the solution is reasonable.	SE: 239–244, 245–252, 253–258, 259–266 TE: 239A–239D, 239–244, 245A–245D, 245–252, 253A–253D, 253–258, 259A–259D, 259–266
AI.SEI.4	Represent real-world problems using a system of two linear inequalities in two variables. Graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes with and without technology. Interpret the solution set and determine whether it is reasonable.	SE: 271–278, 279–286 TE: 271A–271D, 271–278, 279A–279D, 279–286
Quadratic and Exponential Equations and Functions		
AI.QE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. Understand that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. Compare linear functions and exponential functions that model real-world situations using tables, graphs, and equations.	SE: 293–300 TE: 293A–239D, 239–300
AI.QE.2	Represent real-world and other mathematical problems that can be modeled with simple exponential functions using tables, graphs, and equations of the form $y = abx$ (for integer values of $x > 1$, rational values of $b > 0$ and $b \neq 1$) with and without technology; interpret the values of a and b.	SE: 293–300, 301–308, 309–314 TE: 293A–239D, 239–300, 301A–301D, 301–308, 309A–309D, 309–314
AI.QE.3	Use area models to develop the concept of completing the square to solve quadratic equations. Explore the relationship between completing the square and the quadratic formula.	SE: 475–482 TE: 475A–475D, 475–482

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Standard	Descriptor	Citations
AI.QE.4	Solve quadratic equations in one variable by inspection (e.g., for x2 = 49), finding square roots, using the quadratic formula, and factoring, as appropriate to the initial form of the equation.	SE: 431–438, 439–446, 447–454, 455–462, 457–474, 475–482, 483–490, 491–496 TE: 431A–431D, 431–438, 439A–439D, 439–446, 447A–447D, 447–454, 455A–455D, 455–462, 457A–457D, 457–474, 475A–475D, 475–482, 483A–483D, 483–490, 491A–491D, 491–496
AI.QE.5	Represent real-world problems using quadratic equations in one or two variables and solve such problems with technology. Interpret the solution(s) and determine whether they are reasonable.	SE: 431–438, 439–446, 447–454, 455–462, 457–474, 475–482, 483–490, 491–496 TE: 431A–431D, 431–438, 439A–439D, 439–446, 447A–447D, 447–454, 455A–455D, 455–462, 457A–457D, 457–474, 475A–475D, 475–482, 483A–483D, 483–490, 491A–491D, 491–496
AI.QE.6	Graph exponential and quadratic functions with and without technology. Identify and describe key features, such as zeros, lines of symmetry, and extreme values in real-world and other mathematical problems involving quadratic functions with and without technology; interpret the results in the real-world contexts.	SE: 293–300, 301–308, 431–438, 491–496 TE: 293A–293D, 293–300, 301A–301D, 301–308, 431A–431D, 431–438, 491A–491D, 491–496
AI.QE.7	Describe the relationships among a solution of a quadratic equation, a zero of the function, an x-intercept of the graph, and the factors of the expression. Explain that every quadratic has two complex solutions, which may or may not be real solutions.	SE: 431–438, 439–446, 447–454, 455–462, 457–474, 475–482, 483–490, 491–496 TE: 431A–431D, 431–438, 439A–439D, 439–446, 447A–447D, 447–454, 455A–455D, 455–462, 457A–457D, 457–474, 475A–475D, 475–482, 483A–483D, 483–490, 491A–491D, 491–496

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Geometry

Standard	Descriptor	Citations
Process Standards for Mathematics		
PS.1:	Make sense of problems and persevere in solving them.	This standard is covered throughout the course. Representative pages include: SE: 13–20, 41–46, 63–70, 77–84, 105–114, 137–144, 181–188, 195–202, 235–242, 265–272, 289–294, 299–306, 329–336, 375–382, 413–420, 441–450, 475–482, 511–518, 557–564, 583–590, 643–648 TE: 13–20, 41–46, 63–70, 77–84, 105–114, 137–144, 181–188, 195–202, 235–242, 265–272, 289–294, 299–306, 329–336, 375–382, 413–420, 441–450, 475–482, 511–518, 557–564, 583–590, 643–648
PS.2:	Reason abstractly and quantitatively.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 21–28, 41–46, 63–70, 85–92, 105–114, 145–152, 203–208, 227–234, 265–272, 299–306, 321–328, 375–382, 413–420, 451–458, 483–490, 551–556, 583–590, 643–648 TE: 5–12, 21–28, 41–46, 63–70, 85–92, 105–114, 145–152, 203–208, 227–234, 265–272, 299–306, 321–328, 375–382, 413–420, 451–458, 483–490, 551–556, 583–590, 643–648

Standard	Descriptor	Citations
PS.3:	Construct viable arguments and critique the reasoning of others.	This standard is covered throughout the course. Representative pages include: SE: 13–20, 41–46, 63–70, 77–84, 105–114, 153–160, 181–188, 203–208, 219–226, 265–272, 299–306, 321–328, 367–374, 413–420, 441–450, 475–482, 573–578, 591–600, 643–648 TE: 13–20, 41–46, 63–70, 77–84, 105–114, 153–160, 181–188, 203–208, 219–226, 265–272, 299–306, 321–328, 367–374, 413–420, 441–450, 475–482, 573–578, 591–600, 643–648
PS.4:	Model with mathematics.	This standard is covered throughout the course. Representative pages include: SE: 21–28, 47–54, 93–100, 115–122, 153–160, 195–202, 219–226, 273–280, 299–306, 329–336, 367–375, 421–428, 511–528, 523–538, 565–572, 643–648 TE: 21–28, 47–54, 93–100, 115–122, 153–160, 195–202, 219–226, 273–280, 299–306, 329–336, 367–375, 421–428, 511–528, 523–538, 565–572, 643–648
PS.5:	Use appropriate tools strategically.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 55–62, 77–84, 115–122, 137–144, 173–180, 195–202, 219–226, 289–294, 299–306, 345–352, 383–390, 465–474, 539–544, 583–590, 649–656 TE: 5–12, 55–62, 77–84, 115–122, 137–144, 173–180, 195–202, 219–226, 289–294, 299–306, 345–352, 383–390, 465–474, 539–544, 583–590, 649–656
PS.6:	Attend to precision.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 55–62, 77–84, 123–130, 137–144, 173–180, 209–214, 257–264, 299–306, 353–362, 367–374, 405–412, 451–458, 491–498, 523–530, 591–600, 615–622 TE: 5–12, 55–62, 77–84, 123–130, 137–144, 173–180, 209–214, 257–264, 299–306, 353–362, 367–374, 405–412, 451–458, 491–498, 523–530, 591–600, 615–622

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Standard	Descriptor	Citations
PS.7:	Look for and make use of structure.	This standard is covered throughout the course. Representative pages include: SE: 21–28, 55–62, 85–92, 105–114, 145–152, 181–188, 203–208, 219–226, 281–288, 299–306, 337–344, 391–398, 405–412, 441–450, 465–474, 523–530, 583–590, 623–630 TE: 21–28, 55–62, 85–92, 105–114, 145–152, 181–188, 203–208, 219–226, 281–288, 299–306, 337–344, 391–398, 405–412, 441–450, 465–474, 523–530, 583–590, 623–630
PS.8:	Look for and express regularity in repeated reasoning.	This standard is covered throughout the course. Representative pages include: SE: 29–36, 55–62, 93–100, 123–130, 161–168, 209–214, 227–234, 281–288, 307–314, 337–344, 391–398, 429–436, 451–458, 483–490, 531–538, 615–622, 635–642, 648, 656 TE: 29–36, 55–62, 93–100, 123–130, 161–168, 209–214, 227–234, 281–288, 307–314, 337–344, 391–398, 429–436, 451–458, 483–490, 531–538, 615–622, 635–642, 648, 656
Logic and Proofs		
G.LP.1	Understand and describe the structure of and relationships within an axiomatic system (undefined terms, definitions, axioms and postulates, methods of reasoning, and theorems). Understand the differences among supporting evidence, counterexamples, and actual proofs.	SE: 41–46 TE: 41A–41D, 41–46
G.LP.2	Use precise definitions for angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.	SE: 13–20, 47–54, 55–62, 63–70 TE: 13A–13D, 13–20, 47A–47D, 47–54, 55A–55D, 55–62, 63A–63D, 63–70
G.LP.3	State, use, and examine the validity of the converse, inverse, and contrapositive of conditional (“if – then”) and bi-conditional (“if and only if”) statements.	SE: 41–46 TE: 41A–41D, 41–46

Standard	Descriptor	Citations
G.LP.4	Understand that proof is the means used to demonstrate whether a statement is true or false mathematically. Develop geometric proofs, including those involving coordinate geometry, using two-column, paragraph, and flow chart formats.	SE: 47–54, 55–62, 63–70 TE: 47A–47D, 47–54, 55A–55D, 55–62, 63A–63D, 63–70
Points, Lines, and Angles		
G.PL.1	Prove and apply theorems about lines and angles, including the following: ● Vertical angles are congruent. ● When a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent. ● When a transversal crosses parallel lines, same side interior angles are supplementary. ● Points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.	SE: 63–70, 77–84, 85–92, 93–100, 123–130 TE: 63A–63D, 63–70, 77A–77D, 77–84, 85A–85D, 85–92, 93A–93D, 93–100, 123A–123D, 123–130
G.PL.2	Explore the relationships of the slopes of parallel and perpendicular lines. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in coordinate graphs and equations.	SE: 105–114, 115–122 TE: 105A–105D, 105–114, 115A–115D, 115–122
G.PL.3	Use tools to explain and justify the process to construct congruent segments and angles, angle bisectors, perpendicular bisectors, altitudes, medians, and parallel and perpendicular lines.	SE: 5–12, 13–20, 93–100, 265–272, 281–288, 289–294 TE: 5A–5D, 5–12, 13A–13D, 13–20, 93A–93D, 93–100, 265A–265D, 265–272, 281A–281D, 281–288, 289A–289D, 289–294
G.PL.4	Develop the distance formula using the Pythagorean Theorem. Find the lengths and midpoints of line segments in the two-dimensional coordinate system.	SE: 5–12, 29–36 TE: 5A–5D, 5–12, 29A–29D, 29–36

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Standard	Descriptor	Citations
Triangles		
G.T.1	Prove and apply theorems about triangles, including the following: ● Measures of interior angles of a triangle sum to 180°. ● The Isosceles Triangle Theorem and its converse. ● The Pythagorean Theorem. ● The segment joining midpoints of two sides of a triangle is parallel to the third side and half the length. ● A line parallel to one side of a triangle divides the other two proportionally, and its converse. ● The Angle Bisector Theorem.	SE: 219–226, 227–234, 235–242, 243–250, 257–264, 273–280, 281–288 TE: 219A–226, 227A–234, 235A–242, 243A–250, 257A–264, 273A–280, 281A–288
G.T.2	Explore and explain how the criteria for triangle congruence (ASA, SAS, AAS, SSS, and HL) follow from the definition of congruence in terms of rigid motions.	SE: 219–226, 227–234, 235–242, 243–250 TE: 219A–219D, 219–226, 227A–227D, 227–234, 235A–235D, 235–242, 243A–243D, 243–250
G.T.3	Use tools to explain and justify the process to construct congruent triangles.	SE: 195–202, 203–208, 209–214 TE: 195A–195D, 195–202, 203A–203D, 203–208, 209A–209D, 209–214
G.T.4	Use the definition of similarity in terms of similarity transformations, to determine if two given triangles are similar. Explore and develop the meaning of similarity for triangles.	SE: 375–382, 383–390, 391–398 TE: 375A–375D, 375–382, 383A–383D, 383–390, 391A–391D, 391–398
G.T.5	Use congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.	SE: 195–202, 203–208, 209–214, 219–226, 227–234, 235–242, 243–250, 375–382, 383–390, 391–398 TE: 195A–195D, 195–202, 203A–203D, 203–208, 209A–209D, 209–214, 219A–219D, 219–226, 227A–227D, 227–234, 235A–235D, 235–242, 243A–243D, 243–250, 375A375D, 375–382, 383A–383D, 383–390, 391A–391D, 391–398

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Standard	Descriptor	Citations
G.T.6	Prove and apply the inequality theorems, including the following: ● Triangle inequality. ● Inequality in one triangle. ● The hinge theorem and its converse.	SE: 299–306, 307–314 TE: 299A–299D, 299–306, 307A–307D, 307–314
G.T.7	Explore the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. Understand and use the geometric mean to solve for missing parts of triangles.	SE: 281–288 TE: 281A–281D, 281–288
G.T.8	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	SE: 405–412, 413–420, 421–428 TE: 405A–405D, 405–412, 413A–413D, 413–420, 421A–421D, 421–428
G.T.9	Use trigonometric ratios (sine, cosine, tangent and their inverses) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.	SE: 405–412, 413–420, 421–428, 429–436 TE: 405A–405D, 405–412, 413A–413D, 413–420, 421A–421D, 421–428, 429A–429D, 429–436
G.T.10	Explore the relationship between the sides of special right triangles (30° - 60° and 45° - 45°) and use them to solve real-world and other mathematical problems.	SE: 421–428, 429–436 TE: 421A–421D, 421–428, 429A–429D, 429–436
Quadrilaterals and Other Polygons		
G.QP.1	Prove and apply theorems about parallelograms, including those involving angles, diagonals, and sides.	SE: 321–328, 329–336, 337–344, 345–352, 353–362 TE: 321A–321D, 321–328, 329A–329D, 329–336, 337A–337D, 337–344, 345A–345D, 345–352, 353A–353D, 353–362
G.QP.2	Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares, kites, or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.	SE: 321–328, 329–336, 337–344, 345–352, 353–362 TE: 321A–321D, 321–328, 329A–329D, 329–336, 337A–337D, 337–344, 345A–345D, 345–352, 353A–353D, 353–362

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Standard	Descriptor	Citations
G.QP.3	Develop and use formulas to find measures of interior and exterior angles of polygons.	SE: 257–264, 265–272 TE: 257A–257D, 257–264, 265A–265D, 265–272
G.QP.4	Identify types of symmetry of polygons, including line, point, rotational, and self-congruences.	SE: 161–168 TE: 161A–161D, 161–168
G.QP.5	Compute perimeters and areas of polygons in the coordinate plane to solve real-world and other mathematical problems.	SE: 29–36 TE: 29A–29D, 29–36
G.QP.6	Develop and use formulas for areas of regular polygons.	SE: 29–36 TE: 29A–29D, 29–36
Circles		
G.CI.1	Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, congruent circles, and concentric circles.	SE: 523–530, 531–538 TE: 523A–532D, 523–530, 531A–531D, 531–538
G.CI.2	Derive the fact that the length of the arc intercepted by an angle is proportional to the radius; derive the formula for the area of a sector.	SE: 531–538 TE: 531A–531D, 531–538
G.CI.3	Explore and use relationships among inscribed angles, radii, and chords, including the following: ● The relationship that exists between central, inscribed, and circumscribed angles. ● Inscribed angles on a diameter are right angles. ● The radius of a circle is perpendicular to a tangent where the radius intersects the circle.	SE: 465–474, 475–482, 483–490, 503–510, 511–518 TE: 465A–465D, 465–474, 475A–475D, 475–482, 483A–483D, 483–490, 503A–503D, 503–510, 511A–511D, 511–518

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Standard	Descriptor	Citations
G.CI.4	Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).	SE: 523–530, 531–538, 539–544 TE: 523A–523D, 523–530, 531A–531D, 531–538, 539A–539D, 539–544
G.CL.5	Use tools to explain and justify the process to construct a circle that passes through three given points not on a line, a tangent line to a circle through a point on the circle, and a tangent line from a point outside a given circle to the circle.	SE: 483–490 TE: 483A–483D, 483–490
G.CI.6	Use tools to construct the inscribed and circumscribed circles of a triangle. Prove properties of angles for a quadrilateral inscribed in a circle.	SE: 465–474, 475–482, 483–490, 503–510, 511–518 TE: 465A–465D, 465–474, 475A–475D, 475–482, 483A–483D, 483–490, 503A–503D, 503–510, 511A–511D, 511–518
Transformations		
G.TR.1	Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.	SE: 137–144, 145–152, 153–160, 181–188, 209–214 TE: 137A–137D, 137–144, 145A–145D, 145–152, 153A=153D, 153–160, 181A–181D, 181–188, 209A–209D, 209–214
G.TR.2	Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.	SE: 173–180, 181–188 TE: 173A–173D, 173–180, 181A–181D, 181–188
Three-Dimensional Solids		
G.TS.1	Create a net for a given three-dimensional solid. Describe the three-dimensional solid that can be made from a given net (or pattern).	SE: 557–564 TE: 557A–557D, 557–564
G.TS.2	Explore and use symmetries of three-dimensional solids to solve problems.	SE: 551–556 TE: 551A–551D, 551–556

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Standard	Descriptor	Citations
G.TS.3	Explore properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres and use them to solve problems.	SE: 551–556 TE: 551A–551D, 551–556
G.TS.4	Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve composite solids and algebraic expressions.	SE: 551–556, 565–572, 573–578, 583–590, 591–600, 601–608 TE: 551A–551D, 551–556, 565A–565D, 565–572, 573A–573D, 573–578, 583A–583D, 583–590, 591A–591D, 591–600, 601A–601D, 601–608
G.TS.5	Apply geometric methods to create and solve design problems.	SE: 551–556, 565–572, 573–578, 583–590 TE: 551A–551D, 551–556, 565A–565D, 565–572, 573A–573D, 573–578, 583A–583D, 583–590

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Standard	Descriptor	Citations
Process Standards for Mathematics		
PS.1:	Make sense of problems and persevere in solving them.	This standard is covered throughout the course. Representative pages include: SE: 21–30, 59–66, 99–108, 119–124, 161–168, 225–232, 247–254, 267–274, 295–302, 331–340, 369–376, 383–390, 415–422, 445–452, 463–470, 507–512, 533–540, 555–562, 589–596 TE: 21–30, 59–66, 99–108, 119–124, 161–168, 225–232, 247–254, 267–274, 295–302, 331–340, 369–376, 383–390, 415–422, 445–452, 463–470, 507–512, 533–540, 555–562, 589–596
PS.2:	Reason abstractly and quantitatively.	This standard is covered throughout the course. Representative pages include: SE: 13–20, 59–66, 89–98, 125–132, 175–182, 217–224, 239–246, 267–274, 311–316, 323–330, 361–368, 383–390, 437–444, 471–478, 499–506, 525–532, 555–562, 605–612 TE: 13–20, 59–66, 89–98, 125–132, 175–182, 217–224, 239–246, 267–274, 311–316, 323–330, 361–368, 383–390, 437–444, 471–478, 499–506, 525–532, 555–562, 605–612

Standard	Descriptor	Citations
PS.3:	Construct viable arguments and critique the reasoning of others.	This standard is covered throughout the course. Representative pages include: SE: 21–30, 51–58, 99–108, 125–132, 141–148, 175–182, 201–208, 247–254, 275–283, 295–302, 341–350, 361–368, 383–390, 423–430, 445–452, 471–478, 499–506, 513–520, 533–540, 563–570, 597–604 TE: 21–30, 51–58, 99–108, 125–132, 141–148, 175–182, 201–208, 247–254, 275–283, 295–302, 341–350, 361–368, 383–390, 423–430, 445–452, 471–478, 499–506, 513–520, 533–540, 563–570, 597–604
PS.4:	Model with mathematics.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 59–66, 89–98, 113–118, 153–160, 175–182, 209–216, 239–246, 267–274, 303–310, 331–340, 355–360, 391–400, 423–430, 445–452, 463–470, 471–478, 513–520, 533–540, 571–578, 597–604 TE: 5–12, 59–66, 89–98, 113–118, 153–160, 175–182, 209–216, 239–246, 267–274, 303–310, 331–340, 355–360, 391–400, 423–430, 445–452, 463–470, 471–478, 513–520, 533–540, 571–578, 597–604
PS.5:	Use appropriate tools strategically.	This standard is covered throughout the course. Representative pages include: SE: 21–30, 39–46, 75–82, 89–98, 133–140, 153–160, 183–190, 209–216, 275–282, 311–316, 341–350, 369–376, 391–400, 453–458, 479–486, 507–512, 533–540, 563–570, 597–604 TE: 21–30, 39–46, 75–82, 89–98, 133–140, 153–160, 183–190, 209–216, 275–282, 311–316, 341–350, 369–376, 391–400, 453–458, 479–486, 507–512, 533–540, 563–570, 597–604

Standard	Descriptor	Citations
PS.6:	Attend to precision.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 51–58, 75–82, 119–124, 141–148, 183–190, 195–200, 247–254, 275–282, 311–316, 323–330, 355–360, 383–390, 415–422, 445–452, 479–486, 499–506, 541–548, 563–570, 589–598 TE: 5–12, 51–58, 75–82, 119–124, 141–148, 183–190, 195–200, 247–254, 275–282, 311–316, 323–330, 355–360, 383–390, 415–422, 445–452, 479–486, 499–506, 541–548, 563–570, 589–598
PS.7:	Look for and make use of structure.	This standard is covered throughout the course. Representative pages include: SE: 5–12, 21–30, 51–58, 99–108, 113–118, 161–168, 183–190, 209–216, 239–246, 295–302, 323–330, 355–360, 383–390, 415–422, 453–458, 463–470, 487–492, 507–512, 533–540, 555–562, 605–612 TE: 5–12, 21–30, 51–58, 99–108, 113–118, 161–168, 183–190, 209–216, 239–246, 295–302, 323–330, 355–360, 383–390, 415–422, 453–458, 463–470, 487–492, 507–512, 533–540, 555–562, 605–612
PS.8:	Look for and express regularity in repeated reasoning.	This standard is covered throughout the course. Representative pages include: SE: 31–38, 67–74, 89–98, 113–118, 141–148, 153–160, 195–200, 217–224, 267–274, 295–302, 341–350, 361–368, 383–390, 415–422, 423–430, 479–486, 555–562, 563–570 TE: 31–38, 67–74, 89–98, 113–118, 141–148, 153–160, 195–200, 217–224, 267–274, 295–302, 341–350, 361–368, 383–390, 415–422, 423–430, 479–486, 555–562, 563–570

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Standard	Descriptor	Citations
Data Analysis. Statistics, and Probability		
AII.DSP.1	Distinguish between random and non-random sampling methods, identify possible sources of bias in sampling, describe how such bias can be controlled and reduced, evaluate the characteristics of a good survey and well-designed experiment, design simple experiments or investigations to collect data to answer questions of interest, and make inferences from sample results	SE: 571–578, 597–604, 605–612 TE: 571A–571D, 571–578, 597A–597D, 597–604, 605A–605D, 605–612
AII.DSP.2	Interpret and compare univariate data using measures of center (mean and median) and spread (range, inter-quartile range, standard deviation, and variance). Understand the effects of outliers on the statistical summary of the data. AII	SE: 563–570, 579–584 TE: 563A–563D, 563–570, 579A–579D, 579–584
AII.DSP.3	Use technology to find a linear, quadratic, or exponential function that models a relationship for a bivariate data set to make predictions; Interpret the correlation coefficient for linear models.	This standard is covered in Algebra 1.
AII.DSP.4	Using the results of a simulation, decide if a specified model is consistent to those results. Construct a theoretical model and apply the law of large numbers to show the relationship between the two models.	SE: 499–507 TE: 499A–499D, 499–507
AII.DSP.5	Understand dependent and independent events, and conditional probability; apply these concepts to calculate probabilities. AII.DSP	SE: 499–506, 507–512, 513–, 525–532, 533–540, 541–548 TE: 499A–499D, 499–506, 507A–507D, 507–512, 513A–513D, 513–520, 525A–525D, 525–532, 533A–533D, 533–540, 541A–541D, 541–548
AII.DSP.6	Understand the Fundamental Counting Principle, permutations, and combinations; apply these concepts to calculate probabilities.	SE: 605–612 TE: 605A–605D, 605–612

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Standard	Descriptor	Citations
Complex Numbers and Expressions		
AII.CNE.1	Explain how extending the properties of integer exponents to rational numbers allows for a notation for radicals in terms of rational exponents (e.g. 51/3) is defined to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.)	SE: 175–182, 183–190 TE: 175A–175D, 175–182, 183A–183D, 183–190
AII.CNE.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	SE: 175–182, 183–190 TE: 175A–175D, 175–182, 183A–183D, 183–190
AII.CNE.3	Rewrite algebraic rational expressions in equivalent forms (e.g., using properties of exponents and factoring techniques). Add, subtract, multiply, and divide algebraic rational expressions.	SE: 183–190, 355–360, 361–368, 369–376 TE: 183A–183D, 183–190, 355A–355D, 355–360, 361A–361D, 361–368, 369A–369D, 369–376
AII.CNE.4	Rewrite rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x).	SE: 183–190 TE: 183A–183D, 183–190
Functions		
AII.F.1	Understand composition of functions and combine functions by composition.	SE: 195–200 TE: 195A–195D, 195–200
AII.F.2	Define and find the inverse of a function. Verify functions are inverses algebraically and graphically.	SE: 195–200, 201–208 TE: 195A–195D, 195–200, 201A–201D, 201–208
AII.F.3	Understand that if the graph of a function contains a point (a, b), then the graph of the inverse relation of the function contains the point (b, a); the inverse is a reflection over the line y = x.	SE: 195–200, 201–208 TE: 195A–195D, 195–200, 201A–201D, 201–208

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Standard	Descriptor	Citations
AII.F.4	Explore and describe the effect on the graph of f(x) by replacing f(x) with f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative) with and without technology. Find the value of k given the graph of f(x) and the graph of f(x) + k, k f(x), f(kx), or f(x + k).	SE: 21–30, 31–38, 479–486 TE: 21A–21D, 21–30, 31A–31D, 31–38, 479A–479D, 479–486
Systems of Equations and Inequalities		
AII.SEI.1	Solve a system of equations consisting of a linear equation and a quadratic equation in two variables algebraically and graphically with and without technology.	SE: 75–82 TE: 75A–75D, 75–82
AII.SEI.2	Represent and solve real-world systems of linear equations and inequalities in two or three variables algebraically and using technology. Interpret the solution set and determine whether it is reasonable.	Students represent and solve real–world systems of linear equations and inequalities in two variables. SE: 75–82 TE: 75A–75D, 75–82
AII.SEI.3	Represent real-world problems using a system of linear equations in three variables. Understand that the algebraic steps to solve a two variable system can be extended to systems of equations in three variables.	This standard goes beyond the scope of this program.
Quadratic Equations and Functions		
AII.Q.1	Represent real-world problems that can be modeled with quadratic functions using tables, graphs, and equations; translate fluently among these representations. Solve such problems with and without technology. Interpret the solutions and determine whether they are reasonable.	SE: 51–58, 68–74, 75–82 TE: 51A–51D, 51–58, 68A–68D, 68–74, 75A–75D, 75–82
AII.Q.2	Use completing the square to rewrite quadratic functions in vertex form and graph these functions with and without technology.	SE: 51–58 TE: 51A–51D, 51–58

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Standard	Descriptor	Citations
AII.Q.3	Understand that different forms of a quadratic equation can provide different information. Use and translate quadratic functions between standard, vertex, and intercept form to graph and identify key features, including intercepts, vertex, line of symmetry, end behavior, and domain and range.	SE: 39–46 TE: 39A–39D, 39–46
AII.Q.4	Use the discriminant to determine the number and type of solutions of a quadratic equation. Find all solutions and write complex solutions in the form of a ± bi for real numbers a and b.	SE: 67–74 TE: 67A–67D, 67–74
Exponential and Logarithmic Equations and Functions		
AII.EL.1	Graph exponential and logarithmic functions with and without technology. Identify and describe key features, such as intercepts, domain and range, asymptotes and end behavior. Know that the inverse of an exponential function is a logarithmic function.	SE: 247–254, 275–282 TE: 247A–247D, 247–254, 275A–275D, 275–282
AII.EL.2	Identify the percent rate of change in exponential functions. Classify them as representing exponential growth or decay.	SE: 239–246 TE: 239A–239D, 239–246
AII.EL.3	Use the properties of exponents to rewrite expressions to describe transformations of exponential functions.	SE: 239–246 TE: 239A–239D, 239–246
AII.EL.4	Use the properties of exponents to derive the properties of logarithms. Evaluate exponential and logarithmic expressions.	SE: 295–302 TE: 295A–295D, 295–302
AII.EL.5	Solve exponential and logarithmic equations in one variable	SE: 303–310, 311–316 TE: 303A–303D, 303–310, 311A–311D, 311–316

Standard	Descriptor	Citations
AII.EL.6	Represent real-world problems using exponential and logarithmic functions and solve such problems with technology. Interpret the solutions and determine whether they are reasonable.	SE: 239–246, 247–254, 255–262, 267–274, 275–282, 283–290, 295–302, 303–310, 311–316 TE: 239A–239D, 239–246, 247A–274D, 274–254, 255A–255D, 255–262, 267A–267D, 267–274, 275A–275D, 275–282, 283A–283D, 283–290, 295A–295D, 295–302, 303A–303D, 303–310, 311A–311D, 311–316
Polynomial, Rational, and Other Equations and Functions		
AII.PR.1	Solve real-world and other mathematical problems involving polynomial equations with and without technology. Interpret the solutions and determine whether the solutions are reasonable.	SE: 89–98, 99–108, 113–118, 119–124, 125–132, 133–140, 141–148 TE: 89A–89D, 89–98, 99A–99D, 99–108, 113A–113D, 113–118, 119A–119D, 119–124, 125A–125D, 125–132, 133A–133D, 133–140, 141A–141D, 141–148
AII.PR.2	Graph mathematical functions including: a. polynomial functions; b. rational functions; c. square root functions; d. absolute value functions; and, e. piecewise-defined functions with technology. Identify and describe features, such as intercepts, domain and range, end behavior, and lines of symmetry.	SE: 89–98, 99–108, 161–168, 175–182, 209–216, 217–224, 275–282, 331–340, 341–350 TE: 89A–89D, 89–98, 99A–99D, 99–108, 161A–161D, 161–168, 175A–175D, 175–182, 209A–209D, 209–216, 217A–217D, 217–224, 275A–275D, 275–282, 331A–331D, 331–340, 341A–341D, 341–350

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Standard	Descriptor	Citations
AII.PR.3	Solve real-world and other mathematical problems involving radical and rational equations. Give examples showing how extraneous solutions may arise.	SE: 175–182, 183–190, 195–200, 201–208, 209–216, 217–224, 225–232, 323–330, 331–340, 341–350, 355–360, 361–368, 369–376 TE: 175A–175D, 175–182, 183A–183D, 183–190, 195A–195D, 195–200, 201A–201D, 201–208, 209A–209D, 209–216, 217A–217D, 217–224, 225A–225D, 225–232, 323A–323D, 323–330, 331A–331D, 331–340, 341A–341D, 341–350, 355A–355D, 355–360, 361A–361D, 361–368, 369A–369D, 369–376
AII.PR.4	Solve absolute value linear equations and inequalities in one variable.	SE: 31–38 TE: 31A–31D, 31–38