



# Algebra 2

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Competencies and Objectives	Page References
<b>CONTENT STRAND: Number and Operations</b>	
<b>1. Understand relationships among numbers and compute fluently. Verify with technology.</b>	
a. Diagram the relationship among the subsets of the complex number system. (DOK 2)	259-266
b. Compute with rational and radical expressions and complex numbers, expressing in simplest form. (DOK 1)	259-266, 408-414, 422-426, 442-449, 450-456, 479-486
c. Evaluate powers of the imaginary unit, $i$ . (DOK 1)	259-266
d. Perform computations, including addition, scalar multiplication, multiplication, determinants, and inverses on matrices. (DOK 1)	169-176, 177-184, 194-200, 208-215
e. Solve applications and problems in mathematical settings involving arithmetic and geometric sequences and series. (DOK 3)	622-628, 629-635, 636-641, 643-649, 650-655, 657, 658-662
f. Explain and use the inverse relationship between exponential and logarithmic expressions. (DOK 2)	509-517, 536-542
g. Use the properties of logarithms to simplify logarithmic expressions and to find their approximate values. (DOK 1)	509-517, 520-526, 528-533, 534-535, 536-542
h. Solve application problems involving exponential functions related to growth and decay. (DOK 3)	544-550, 551
<b>CONTENT STRAND: Algebra</b>	
<b>2. Use algebraic concepts to identify patterns, use multiple representations of relations and functions, and apply operations to expressions, equations, and inequalities.</b>	
a. Solve compound and absolute value inequalities, graphing and writing solutions in interval notation. (DOK 2)	27-31, 33-39, 41-48
b. Solve systems of absolute value and quadratic equations using a variety of solution methods including graphing. (DOK 2)	95-101, 598-602
c. Given constraints, find the maximum and minimum value(s) of a system of linear inequalities and explain your reasoning. (DOK 2)	130-135, 136, 138-144
d. Given the solution(s) to a quadratic equation, find a quadratic equation to fit the solution(s) and explain or justify the solution process. (DOK 2)	253-258

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<b>e.</b> Use the discriminant to classify and predict the types of solutions of quadratic equations and justify the classification. (DOK 2)	276-283
<b>f.</b> Factor sums and differences of cubes and factor polynomials by grouping. (DOK 2)	349-355
<b>g.</b> Solve radical equations. (DOK 2)	422-427, 428-429
<b>h.</b> Write equivalent forms of rational expressions using real and complex conjugates. (DOK 2)	259-266, 408-414, 442-459, 450-456
<b>i.</b> Solve equations involving rational expressions and verify solutions. (DOK 2)	479-486, 487-488
<b>j.</b> Explain the results of compositions of functions. (DOK 2)	384-390
<b>k.</b> Explain the Binomial Theorem and use it to expand binomial expressions raised to positive integral powers. (DOK 2)	664-669
<b>l.</b> Interpret the zeros and maximum or minimum value(s) of quadratic functions. (DOK 2)	339-345
<b>CONTENT STRAND: Geometry</b>	
<b>3. Use coordinate geometry to specify locations, describe relationships, and apply transformations to analyze algebraic relationships.</b>	
<b>a.</b> Determine and justify whether the inverse of a relation or a function exists. (DOK 2)	391-396
<b>b.</b> Classify functions based on sketches of their graphs. (DOK 2)	473-478
<b>c.</b> Sketch and describe transformations of quadratic and absolute value functions. (DOK 2)	95-101, 284-285, 286-292, 293
<b>d.</b> Represent complex numbers and the sum of complex numbers in a complex coordinate plane. (DOK 1)	259-266
<b>e.</b> Identify and sketch the essential graphs of the four conic sections: circle, parabola, ellipse, and hyperbola. (DOK 1)	567-573, 574-579, 580, 581-588, 590-597
<b>CONTENT STRAND: Measurement</b>	
<b>4. Understand measurable attributes of objects and apply appropriate techniques and formulas to determine measurements.</b>	
<b>a.</b> Verify the appropriateness of the numerical value and the units of a variable in an equation. (DOK 2)	Throughout the text, including 18-26, 58-64, 66-70
<b>b.</b> Describe the level of accuracy of measurements in real-world situations by using absolute value inequalities. (DOK 1)	41-48
<b>CONTENT STRAND: DATA ANALYSIS &amp; PROBABILITY</b>	
<b>5. Use technology to represent, analyze, and make inferences based on data.</b>	
<b>a.</b> Through the use of technology, use scatter plots and linear and quadratic regression analysis to determine an appropriate function to model real-life data. (DOK 3)	86-91, 92-94, 252
<b>b.</b> Solve simple combinations. (DOK 2)	690-695
<b>c.</b> Model a data set using the median-fit-method with a linear equation and make predictions based on the model and the equation. (DOK 3)	86-91, 92-94
<b>d.</b> Identify the difference between permutations and combinations and use them to solve real-world problems. (DOK 2)	690-695, 697-702