Bellarmine Algebra 2 Proficiency Exam Content

The Bellarmine Algebra 2 Proficiency Exam is in alignment with the Algebra 2 curriculum of the Common Core, and includes questions that pertain to the topics listed below.   The Algebra 2 Exam is based on the ALEKS High School California Algebra 2 course. For additional content information please go to www.aleks.com.

1. Real Numbers and Linear Equations & Inequalities
   a. Arithmetic Operations on Integers and Fractions
   b. Rules of Exponents
   c. Properties of Real Numbers
   d. Solving Linear Equations
   e. Modeling with Linear Equations
   f. Solving Linear Inequalities
   g. Modeling with Linear Inequalities
   h. Absolute Value Equations and Inequalities
2. Lines and Functions on the Coordinate Plane
   a. Plotting Ordered Pairs
   b. Graphing Lines
   c. Finding Slope
   d. Writing an Equation of a Line
   e. Graphing Linear Inequalities
   f. Identifying Functions from Relations
   g. Domain and Range of a Function
   h. Parabolas, Cubic Functions, Absolute Value Functions
3. Solving Systems of Linear Equations
   a. Solving Systems Using Substitution
   b. Solving Systems Using Elimination with Multiplication and Addition
   c. Identifying Inconsistent, Dependent Systems
   d. Solving A System of Three Linear Equations in Three Unknowns
   e. Modeling with Systems of Equations
   f. Solving Systems of Linear Inequalities
4. Exponents and Polynomial Expressions
   a. Product, Quotient, Power Rules of Exponents
   b. Simplifying a Sum or Difference of Polynomials
   c. Multiplying Polynomials
   d. Conjugate Binomials
   e. Greatest Common Factor of Polynomials
   f. Techniques of Factoring Polynomials
   g. Finding zeros of a Polynomial Function
   h. Polynomial Long Division
5. Quadratic Functions
   a. Finding Roots of a Quadratic Equation
   b. Completing the Square

    c.   Rewriting a Quadratic Function to Find the Vertex

    d.   Applying the Quadratic Formula

    e.   Discriminant of a Quadratic Equation

    f.   Modeling with Quadratic Equations

    g.   Graphing a Parabola

    h.   Solving a Quadratic Inequality

    i.   Graphing a Quadratic Inequality

6. Complex Numbers
    a. Using i to Rewrite Square Roots
    b. Arithmetic of Complex Numbers
    c. Simplifying a Power of i
    d. Multiplying Complex Conjugates

7. Radical Expressions
    a. Domain and Range
    b. Simplifying Radical Expressions
    c. Arithmetic of Radical Expressions
    d. Rationalizing the Denominator of a Radical Expression
    e. Rational Exponents
    f. Solving a Radical Equation

8. Combining Functions
    a. Sum, Difference, Quotient, Product of Two Functions
    b. Composition of Two Functions
    c. Inverse Functions

9. Exponential and Log Functions
    a. Converting between Exponential and Log Equations
    b. Properties of Logs
    c. Solving Log Equations
    d. Solving Exponential Equations

10. Rational Expressions (Ratios of Monomials and Polynomials)
    a. Domain and Range
    b. Simplifying a Ratio of Rational Expressions
    c. Adding and Subtracting Rational Expressions
    d. Multiplying and Dividing Rational Expressions
    e. Solving Equations with Rational Expressions
    f. Simplifying Complex Fractions Composed of Rational Expressions

11. Conic Sections
    a. Equations of Parabolas, Circles, Ellipses, Hyperbolas
    b. Classifying Conic Sections
    c. Graphing Conic Sections

12. Algebraic and Geometric Sequences

13. Trigonometry
    a. Right triangle trigonometry
    b. Unit circle analysis
    c. Analysis of, and manipulation of trig functions

      d.   Trigonometric identities

14. Probability and Statistics
      a.   Outcome and event probability
      b.   Finding the Mode and Range of a Data Set
      c.   Mean, Median, Standard Deviation of a Data Set