

## ALGEBRA II

**STANDARD 1: Number Systems and Algebraic Operations - The student will perform operations with real numbers, complex numbers and matrices.**

1. Define and perform operations on real and complex numbers.

**ACT Strand and Score Range: Number Concepts 24-27, 28-32** *Exhibit some knowledge of the complex numbers (no examples) Multiply two complex numbers (no examples)*

2. Convert expressions from radical notations and vice versa.

3. Matrices

a. Add, subtract, and multiply matrices to solve problems.

b. Find the inverse and determinant of a matrix to solve problems.

c. Use matrices to solve systems of equations.

**STANDARD 2: Relations and Functions - The student will use functions and relations to solve problems.**

1. Recognize the parent graph of the function  $y = x^2$  and predict the effects of transformations on the parent graph (e.g.,  $y = x^2 + 3$  shifts the graph up 3,  $y = 3x^2$  creates vertical stretching by a factor of 3).

**ACT Strand and Score Range: Graphical Representations 33-36** *Identify characteristics of graphs based on a set of conditions or on a general equation such as  $y = ax^2 + c$  (no examples)*

2. Solve, graph and analyze systems of linear equations and inequalities.

**ACT Strand and Score Range: Equations and Inequalities 28-32** *Find solutions to systems of linear equations (no example)*

3. Solve quadratic equations by graphing, factoring, completing the square and quadratic formula.

**ACT Strand and Score Range: Equations and Inequalities 28-32** *Solve absolute value and quadratic equations (MCG p. 95)*

4. Compare the relationship between the x-intercepts (zeros) of a quadratic function and the roots of a quadratic equation to solve problems.

5. Interpret the maximum and minimum value and the y-intercept of a quadratic function.

**ACT Strand and Score Range: Graphical Representations 28-32, 33-36** *Recognize special characteristics of parabolas and circles (no examples) Identify characteristics of graphs based on a set of conditions or on a general equation such as  $y = ax^2 + c$  (no example)*

6. Identify, graph, and write the equations of the conic sections.

**ACT Strand and Score Range: Graphical Representations 28-32** *Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) (no examples)*

7. Define and distinguish between relations and functions.

8. Use functional notation and specify domain and range.

**ACT Strand and Score Range: Functions 20-23** *Work with function notation in evaluating simple quadratic functions at integer values (MCG p. 102)*

9. Find and graph the inverse of a function.

Oklahoma PASS Mathematics Content Standards  
matched to EPAS Mathematics Standards for Transition

10. Exponential and Logarithmic Functions

a. Interpret and graph exponential and logarithmic functions.

**ACT Strand and Score Range: Number Concepts 33-36** Exhibit knowledge of logarithms and geometric sequences (no examples)

b. Apply the inverse relationship between exponential and logarithmic functions.

c. Use exponential and logarithmic functions to solve problems (e.g., compound interest, exponential growth or exponential decay).

11. Solve multistep problems using concepts such as rate, distance, ratio and proportion, average, and percent.

**ACT Strand and Score Range: Basic Operations and Applications 20-23, 28-32** Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, computing an average with negative integers, and computing with a given average (MCG p. 24, 56) Solve word problems containing several rates, proportions, or percentages (MCG p. 85, 87)

12. Polynomials

a. Use synthetic division to find the solutions of a polynomial.

b. Use factoring to find the solutions of a polynomial.

**ACT Strand and Score Range: Algebraic Expressions 24-27** Factor simple quadratics (e.g., the difference of squares and perfect square trinomials) (no examples)

**ACT Strand and Score Range: Equations and Inequalities 28-32** Solve absolute value and quadratic equations (MCG p. 95)

c. Graph a polynomial and identify the x- and y-intercepts, relative maximums and relative minimums.

**ACT Strand and Score Range: Graphical Representations 33-36** Identify characteristics of graphs based on a set of conditions or on a general equation such as  $y = ax^2 + c$  (no examples)

13. Rational Expressions and Equations

a. Simplify rational expressions.

b. Solve rational equations.

c. Graph rational expressions and identify x- and y-intercepts, horizontal asymptotes and vertical asymptotes.

**STANDARD 3: Data Analysis and Statistics - The student will use data analysis and statistics to formulate and justify predictions from a set of data.**

1. Collect data involving two variables and display on a scatter plot, interpret results using a linear, exponential or quadratic model/equation and identify whether the model/equation is a curve of best fit for the data.

2. Analyze and synthesize data using measures of central tendency and standard deviation.

3. Identify how given outliers affect representations of data (e.g., a regression line may be strongly affected by a few aberrant points while the same aberrant points might indicate a mistake on a scatter plot).

3. Differentiate between arithmetic and geometric sequences and series.

**ACT Strand and Score Range: Number Concepts 33-36** Exhibit knowledge of logarithms and geometric sequences (no examples)