

Algebra IIB

GOALS: Students will develop skills and understanding in:

1. The basic concepts of algebra
2. Graphs of linear equations
3. Systems of linear equations and problem solving
4. Solving systems of linear inequalities and linear programming
5. Solving polynomial equation and operations with polynomial expressions
6. Simplifying rational expressions and solving rational equations
7. Solving radical equations and properties of exponents and powers
8. Solving quadratic equations by square roots, graphing, completing the square, and the quadratic formula.

Goal 1. The basic concepts of algebra

OBJECTIVES: Students will be able to: (*Objective numbers refer to Intermediate Algebra, Bittinger and Ellenbogen, sixth edition*)

- 1.11 Use the real number line to graph and order real numbers
- 1.12 Use the properties of real numbers
- 1.2 Evaluate an algebraic expression
- 1.3 Solve a linear equation
- 1.4 Use problem solving strategies to solve real-life problems
- 1.5 Solve a literal equation for a given variable and evaluate it for specified values
- 1.6 Use properties of exponents to simplify algebraic expressions
- 1.7 Convert to and from scientific notation.

Goal 2. The algebra of functions

OBJECTIVES: Students will be able to:

- 2.11 Sketch a graph using a table of values
- 2.12 Identify equations whose graphs are horizontal or vertical lines
- 2.21 Find the slope of a line and identify parallel and perpendicular lines from their slopes
- 2.31 Use intercepts to sketch a quick graph of a line
- 2.32 Use the slope-intercept form of a line to sketch a quick graph
- 2.4 Write equations of lines
- 2.5 Use data from real life models to write equations of lines

Goal 3. Solving systems of linear equations by graphing, substitution, linear combination

OBJECTIVES: Students will be able to:

- 3.1 Graph and solve a system of linear equations
- 3.2 Use algebraic methods to solve a linear system
- 3.3 Write and use linear systems to model real-life problems

Goal 4. Solving a system of linear inequalities

OBJECTIVES: Students will be able to:

- 4.1 Use properties of inequalities to simplify and graph
- 4.2 Solve and graph compound inequalities
- 4.3 Convert absolute value inequalities into graphs and solve
- 4.4 Graph inequalities in two variables
- 4.5 Solve linear programming applications

Goal 5. Solving polynomial equation and operations with polynomial expressions

OBJECTIVES: Students will be able to:

- 5.1 Add and subtract polynomials
- 5.2 Multiply polynomials
- 5.3 Factor polynomial expressions and equations
- 5.4 Factor trinomials
- 5.5 Factor special trinomials
- 5.6 Factor cubic polynomials
- 5.7 Simplify mixed factoring problems
- 5.8 Solve polynomial equations by factoring

Goal 6. Relations and functions

OBJECTIVES: Students will be able to:

- 6.1 Multiply and divide rational expressions
- 6.2 Add and subtract rational expressions
- 6.3 Simplify complex expressions
- 6.4 Solve and graph rational equations
- 6.5 Solve applications using rational equations
- 6.6 Divide polynomials
- 6.7 Streamline long division and apply remainder theorem.
- 6.8 Solve formulas for a specific letter

Goal 7. Solving radical equations and properties of exponents and powers

OBJECTIVES: Students will be able to:

- 7.1 Use properties of exponents to evaluate and simplify exponential expressions
- 7.2 Use the properties of rational exponents to simplify radical expressions
- 7.3 Evaluate n th roots of real numbers using radical notation and rational exponent notation
- 7.4 Use the properties of roots to evaluate and simplify expressions containing radicals and rational exponents
- 7.5 Perform operations involving radical expressions.
- 7.6 Solve equations that have radicals and rational exponents
- 7.7 Solve geometric applications involving radical expressions.
- 7.8 Use complex numbers and their properties.

Goal 8. Solving quadratic equations

OBJECTIVES: Students will be able to:

- 8.1 Solve quadratic equations by completing the square
- 8.2 Apply the quadratic formula
- 8.3 Use quadratic equations in formulas
- 8.4 Determine the nature of the roots of a quadratic using the discriminant.
- 8.5 Solve equations that are quadratic in nature.
- 8.6 Translate the graphs of quadratic functions.
- 8.7 Graph quadratic functions using the intercepts.
- 8.8 Use quadratic functions in applications problem solving.
- 8.9 Solve polynomial inequalities