

Campbell County School District # 1
Gillette, Wyoming

Mathematics - Grade 7

Seventh grade math curriculum helps students build computational competence through a variety of techniques. Instruction emphasizes a variety of ways to compute, the importance of checking whether results are reasonable, and the need to make decisions on how to compute in a problem-solving situation. Math reasoning and communications are integrated through group work; the use of manipulatives; and the appropriate use of calculators when working with whole numbers, decimals, fractions, percents, geometry, data analysis, and integers. An introduction to algebra with many enrichment topics will be included as part of this course.

Textbook/Resources: CPM Foundations for Algebra (Year 1)

MA-07-01 STATISTICS AND PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA7.5.1 Histograms to Collect/Organize/Analyze Data

MA7.5.2 Calculate Mean/Median/Mode/Range for Data Sets

MA7.5.3 Predict/Compare/Report Outcomes as Ratios

Students will have experiences with data analysis and concepts of chance (probability) that allow them to describe and interpret the world around them.

Data Analysis is the process of formulating and solving problems that involve the systematic collection, organization, interpretation, and analysis of information. Students will construct, read, and interpret tables, charts, and graphs. Students will generate new information and hypothesize situations based on the analysis. The students will explore probability in real-world situations by devising and performing experiments. They will compare experimental and theoretical probabilities and use them to make predictions.

MA-07-01-01 - Mean, Median, Mode, Stem, and Leaf (Objective)

C-CS - Critical-Assessment at Content Standard

Students will calculate mean, median, mode, and range for data sets and use in real-world settings.

MA-07-01-02 - Data Analysis (Objective)

C-CS - Critical-Assessment at Content Standard

Students will systematically collect, organize, describe, and analyze data using histograms.

MA-07-01-03 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will predict, compare, and report as ratios probable outcomes of experiments or simulations (i.e., impossible, equally likely, certain).

MA-07-02 ALGEBRAIC CONCEPTS AND RELATIONSHIPS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA7.1.2 Basic Operations With Integers to Solve Problems

MA7.1.7 Apply Order of Operations

MA7.4.1 Translate Word Phrases Into Math Expressions

MA7.4.2 Solve 1-Step Linear Equations

MA7.4.3 Order of Operations to Evaluate Algebraic Expressions

MA7.4.4 Basic Concepts of Coordinate System

Patterns are the regularities occurring in events, shapes, designs, and sets of numbers. They are everywhere and are the essence of mathematics. Students will recognize, describe, extend, create, and generalize patterns by using manipulatives, numbers, and graphic representations. They will communicate their understanding in writing. Students will explore algebraic concepts in informal ways (emphasizing physical models, data, and graphs) to prepare for the formal study of algebra. Students will generalize number patterns and develop an understanding of the concepts of variables, expressions, and equations. They will understand and apply the basic concepts and operations of integers.

MA-07-02-01 - Understanding Integers (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate understanding of positive and negative integers. They will apply integers to real-life situations. Students will give the coordinates of an integer on a number line and plot the points for given integers on a number line.

MA-07-02-02 - Solve Problems Using Order of Operations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use the standard order of operations in simplifying two- or three-step expressions. Calculator operation should also be included.

MA-07-02-03 - Integers and Operations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will add, subtract, and multiply integers. Students should develop understanding using informal methods and manipulatives (i.e., integer tiles). They should be encouraged to derive the generalizations of the rules from numerous examples.

MA-07-02-04 - The Coordinate System (Objective)

C-CS - Critical-Assessment at Content Standard

Students understand and use basic concepts of the coordinate system, including plotting points in all four quadrants.

MA-07-02-05 - Solve One-Step Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve one-step linear equations.

MA-07-02-06 - Evaluate Algebraic Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will evaluate algebraic expressions and formulas using order of operations, given positive integer values for variables.

MA-07-03 GEOMETRY AND MEASUREMENT - Part 1 (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA7.1.2 Basic Operations With Integers to Solve Problems

MA7.2.1 Classify/Describe 1-D and 2-D Geometric Objects

MA7.2.3 Reasoning Used to Identify Geometric Relationships

MA7.3.5 Calculate Areas of Triangle, Trapezoid

Geometry - The students will discover relationships and develop spatial sense by constructing, describing, measuring, visualizing, comparing, and classifying one- and two-dimensional geometric figures. Students will select and use appropriate methods, tools, and units to solve problems involving perimeter and area.

MA-07-03-01 - Classifying and Describing Objects (Objective)

C-CS - Critical-Assessment at Content Standard

Students will classify and describe one-and two-dimensional geometric objects including:

- lines, rays, segments, and angles
- parallel and perpendicular relationships
- regular polygon types

MA-07-03-02 - Area and Perimeter (Objective)

C-CS - Critical-Assessment at Content Standard

Students will calculate the areas of triangles and trapezoids and draw geometric figures given specific properties of the figures.

MA-07-04 PROPORTIONAL REASONING (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA7.1.2 Basic Operations With Integers to Solve Problems
- MA7.1.4 Explain Estimation/Problem-Solving Strategies
- MA7.2.2 Geometric Figures; Congruence and Similarity
- MA7.3.1 Estimate/Measure Length in US Customary & Metric
- MA7.3.2 Estimate/Measure Weight in Metric Units
- MA7.4.2 Solve 1-Step Linear Equations

MA-07-04-01 - Ratios and Proportions (Objective)

C-CS - Critical-Assessment at Content Standard

The students will set up ratio tables and use ratios and proportions to solve problems.

MA-07-05 NUMBER CONCEPTS AND OPERATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA7.1.1 Represent/Order Rational Numbers
- MA7.1.3 Divide Decimal Numbers by Decimal Numbers
- MA7.1.4 Explain Estimation/Problem-Solving Strategies
- MA7.1.5 Multiply/Divide Fractions and Mixed Numbers

Number Operations is the arithmetic of whole numbers, fractions, decimals, integers, and rational numbers. Students will apply number theory concepts (factors, multiples, and primes) and use ratios and proportions in solving real-life problems. The students will understand how the basic arithmetic operations are related to one another and will be able to select and use an appropriate method for computing from among mental computations (mental math), paper-and-pencil, and calculator. They will be able to employ a variety of estimation strategies to determine the reasonableness of results and to solve problems.

MA-07-05-01 - Relationships Among Fractions, Percents, Decimals (Objective)

C-CS - Critical-Assessment at Content Standard

The students will understand and describe the relationships among and be able to interchange fractions, decimals, and percents. Students will compare and order numbers

for rational numbers written in different forms. They will be able to make reasonable estimates and justify their solutions.

MA-07-05-02 - Mixed Numbers Operations (Objective)

C-CS - Critical-Assessment at Content Standard

The students will add, subtract, multiply, and divide any combination of fractions and mixed numbers with like and unlike denominators and regrouping. Problems will be in horizontal or vertical format. Renaming answers should be discussed but not required.

Fractions may be proper or improper.

MA-07-05-03 - Multiply and Divide Decimal Numbers (Objective)

C-CS - Critical-Assessment at Content Standard

Students will multiply and divide decimal numbers.

MA-07-06 GEOMETRY AND MEASUREMENT - Part 2 (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA7.2.1 Classify/Describe 1-D and 2-D Geometric Objects

MA7.2.2 Geometric Figures; Congruence and Similarity

MA7.2.3 Reasoning Used to Identify Geometric Relationships

MA7.3.4 Determine Circumference of a Circle

MA7.3.6 Measure Angles With a Protractor

***MA7.1.6 Evaluate Whole Numbers in Exponential Form (taught, not tested)*

Measurement is the estimation and selection of appropriate units and tools to determine length, weight, money, time, capacity, and angle measure.

Geometry includes working with congruent figures, classifying triangles, naming angles, and finding the measures of angles with and without tools.

MA-07-06-01 - Angles and Triangles (Objective)

C-CS - Critical-Assessment at Content Standard

Students will classify and describe one- and two-dimensional geometric objects, including:

- lines, rays, segments, and angles
- parallel and perpendicular relationships
- regular polygon types

MA-07-06-02 - Congruency (Objective)

C-CS - Critical-Assessment at Content Standard

Students will make conjectures about geometric figures based on knowledge of congruence and similarity.

MA-07-06-03 - Angle Measurement (Objective)

C-CS - Critical-Assessment at Content Standard

Students will measure angles with a protractor and will find angle measure using given information of triangles.

MA-07-06-04 - Circumference (Objective)

C-CS - Critical-Assessment at Content Standard

Students will determine the circumference of a circle using models.

Campbell County School District # 1 Gillette, Wyoming

Mathematics - Pre-Algebra (Grade 8)

Pre-Algebra will strengthen students' skills in mathematical operations when using the rational number system, specifically integers, fractions, and radicals. The students will apply these skills in the study of basic algebra concepts which include, but are not limited to, expressions, equations, inequalities, problem solving strategies, data analysis, probability, and geometry. Students will use manipulatives and scientific and/or graphing calculators in problem solving investigations.

Textbook/Resources: CPM Foundations for Algebra (Year 2)

MA-PA-01 INTEGER OPERATIONS/GRAPHING LINEAR EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA8.1.2 Extend Understanding/Use of Basic Arithmetic Operations

MA8.1.4 Properties of Operations With Rational Numbers

MA8.2.5 Rectangular Coordinate Plane for Geometric Figures

MA8.4.3 Evaluate Algebraic Expressions/Formulas

MA8.4.4 Create Table/Graph Solutions on Coordinate System

MA8.5.1 Collect/Organize/Describe/Analyze Data

The students will add, subtract, multiply, and divide integers. Their understanding of integers will be developed by the use of integer tiles and real-life situations where positive and negative numbers are used. Students will also graph simple linear equations by creating tables and plotting the points on the coordinate system.

MA-PA-01-01 - Integer Operations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will perform the four basic operations on integers and will be able to justify their answers with an explanation or diagram.

MA-PA-01-02 - Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Using linear equations, students will create a table and graph the solutions on the coordinate system.

MA-PA-02 DATA ANALYSIS and PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA8.1.1 Represent/Use Numbers in Equivalent Forms

MA8.1.4 Properties of Operations With Rational Numbers

MA8.5.1 Collect/Organize/Describe/Analyze Data

MA8.5.2 Calculate Mean/Median/Mode/Range for Data Sets

MA8.5.3 Predict, Compare, Calculate Probable Outcomes

MA8.5.4 Probability Concepts for Likelihood of Events

The students will have experience with data analysis and concepts of chance (probability) that allow them to describe and interpret the world around them. **Data Analysis** is the process of formulating and solving problems that involve the systematic collection, organization, interpretation, and analysis of information. Students will construct, read, and interpret tables, charts, and graphs. They will make inferences and convincing arguments based on the data. Students will generate new information and hypothesize situations based on the analysis. Students will explore probability in real-world situations by devising and performing experiments. They will compare experimental and theoretical probabilities and use them to make predictions.

MA-PA-02-01 - Data Analysis in Real-World Situations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will systematically collect, organize, describe, analyze, and represent data using tables, charts, diagrams, and graphs.

MA-PA-02-02 - Measures of Central Tendency (Objective)

C-CS - Critical-Assessment at Content Standard

Students will calculate mean, median, mode, and range for data sets and use in a real-world setting appropriate to grade level.

MA-PA-02-03 - Predicting Outcomes/Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will predict, compare, and calculate probable outcomes of experiments or simulations.

MA-PA-02-04 Likelihood of Events/Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will communicate about the likelihood of events using concepts from probability such as impossible, equally likely, and certain appropriate to grade level.

MA-PA-03 ALGEBRAIC EXPRESSIONS and SOLVING EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA8.1.2 Extend Understanding/Use of Basic Arithmetic Operations

***MA8.1.3 Explain Estimation/Problem Solving Strategy Choice (taught, not tested)*

MA8.4.1 Translate Word Phrases for 4 Basic Math Operations

MA8.4.2 Solve 1- and 2-Step Linear Equations

MA8.4.3 Evaluate Algebraic Expressions/Formulas

The students will demonstrate an understanding of equations to model and interpret problems derived from real-life situations. They will be able to translate and solve one- and two-step single variable (linear) equations. The students will develop an understanding of and be able to use variables and algebraic expressions. The students will evaluate and/or simplify expressions using substitution, combining like terms, and the distributive property. Students will also translate between word phrases and algebraic expressions.

MA-PA-03-01 Modeling Verbal Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will translate word phrases which involve the four basic operations to mathematical expressions.

MA-PA-03-02 Evaluating Algebraic Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will evaluate algebraic expressions and formulas given integer values for variables. They will do this by checking their answers after solving equations in this unit.

MA-PA-03-03 Solving Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve one-and two-step linear equations, each with an integer coefficient and integer solutions.

MA-PA-04 AREA, PERIMETER, and PROPORTIONAL REASONING (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA8.1.1 Represent/Use Numbers in Equivalent Forms

MA8.1.2 Extend Understanding/Use of Basic Arithmetic Operations

MA8.1.3 Explain Estimation/Problem Solving Strategy Choice

MA8.1.4 Properties of Operations With Rational Numbers

MA8.2.1 Classify/Describe 1D, 2D, 3D Geometric Shapes

MA8.2.2 Make Conjectures About Geometric Objects

MA8.2.4 Reasoning Used to Identify Geometric Relationships

***MA8.3.1 Estimate/Measure Length in US Customary & Metric (taught, not tested)*

MA8.3.2 Estimate/Measure Capacity/Volume in Metric Units

MA8.3.3 Select/Use Appropriate Methods, Tools, Units

The students will use proportional reasoning to solve real-life problems. These problems include conversions in both English and metric units of measure, percent problems, and will also include finding lengths of corresponding sides of similar figures. The students will also find the area and perimeter of polygons and the area and circumference of circles.

MA-PA-04-01 - Ratios and Proportions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use ratios and proportions to set up and solve real-life problems including similar figure and conversion problems.

MA-PA-04-02 - Area and Perimeter (Objective)

C-CS - Critical-Assessment at Content Standard

Students will compute the area and perimeter of polygons, including trapezoids, parallelograms, triangles, squares, and rectangles. Students will also find the area and circumference of circles.

MA-PA-05 PYTHAGOREAN THEOREM, SURFACE AREA, VOLUME (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA8.1.1 Represent/Use Numbers in Equivalent Forms

MA8.1.2 Extend Understanding/Use of Basic Arithmetic Operations

MA8.1.3 Explain Estimation/Problem Solving Strategy Choice

MA8.1.4 Properties of Operations With Rational Numbers

MA8.2.1 Classify/Describe 1D, 2D, 3D Geometric Shapes

MA8.2.3 Use Geometric Formulas incl. Pythagorean Theorem

MA8.2.4 Reasoning Used to Identify Geometric Relationships

***MA8.3.1 Estimate/Measure Length in US Customary & Metric (taught, not tested)*

***MA8.3.2 Estimate/Measure Capacity/Volume in Metric Units (taught, not tested)*

MA8.3.3 Select/Use Appropriate Methods, Tools, Units

MA8.4.3 Evaluate Algebraic Expressions/Formulas

The students will investigate further topics of measurement and geometry including the Pythagorean Theorem to real-life situations. Students will increase their understanding of square roots and squaring numbers while working with the Pythagorean Theorem. Students will also learn how to find the surface area and volume of many three-dimensional figures and apply these skills to real-life problems.

MA-PA-05-01 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use geometric formulas including the Pythagorean Theorem on basic diagrams as well as applications to real-life problems.

MA-PA-05-02 - Surface Area and Volume (Objective)

C-CS - Critical-Assessment at Content Standard

Students will select and use the appropriate methods, tools, and units to solve problems involving surface area and volume of rectangular solids, prisms, and cylinders.

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Mathematics - Algebra I

Algebra I is an introductory course in Algebra and fulfills the Algebra graduation requirement. Problem solving, working with variables and exponents, setting up and solving proportions, and solving/graphing linear and quadratic equations are the major concepts studied during Algebra I. Connections between these concepts are made continually throughout the Algebra I curriculum.

Textbook/Resources: College Preparatory Mathematics (CPM) Algebra Connections

MA-A1-01 ALGEBRAIC EXPRESSIONS, PROBLEM SOLVING (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.1.4 Use Proportional Reasoning to Solve Problems

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.3 Identify/Apply Scale, Ratio, Proportion

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use problem-solving skills to solve real-life problems. Students will evaluate and simplify algebraic expressions by combining like terms and using order of operations.

MA-A1-01-01 - Simplify and Evaluate Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify algebraic expressions by combining like terms and evaluate algebraic expressions by substituting and using order of operations.

MA-A1-01-02 – Problem Solving (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve real-life problems using several problem solving strategies including working backwards, guess and check, and analyzing data.

MA-A1-02 PATTERN RECOGNITION, GRAPHING LINEAR EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.1.4 Use Proportional Reasoning to Solve Problems

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.3 Graph Linear Equations, Interpret the Results
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations
- MA11.4.5 Connect Algebra with Other Mathematical Topics

Students will recognize patterns and graph linear equations.

MA-A1-02-01 – Pattern Recognition (Objective)

C-CS - Critical-Assessment at Content Standard

Students will recognize patterns, most which represent linear growth, and use this information to develop linear equations that represent the situation

MA-A1-02-02 – Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph linear equations using tables, data from real-life situations, and also by using their knowledge of slope and y-intercept.

MA-A1-03 MULTIPLYING POLYNOMIALS, SOLVING EQUATIONS, PROPORTIONAL REASONING, SYSTEMS OF EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.3 Identify/Apply Scale, Ratio, Proportion
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations
- MA11.4.5 Connect Algebra with Other Mathematical Topics

Students will multiply polynomials, solve equations, use proportional reasoning to solve real-life problems, and solve systems of equations.

MA-A1-03-01 – Multiplying Polynomials (Objective)

C-CS - Critical-Assessment at Content Standard

Students will multiply polynomials using algebra tiles as models, and also by using generic rectangles and distributing.

MA-A1-03-02 – Solving Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve multiple step linear equations including equations with variables on both sides, and equations that require use of the distributive property and combining like terms.

MA-A1-03-03 – Proportional Reasoning (Objective)

C-CS - Critical-Assessment at Content Standard

Students will find solutions to real-life problems by setting up and solving proportions.

MA-A1-03-04 – Systems of Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve linear systems of equations by using substitution and/or elimination. Students will also set up and solve systems of equations in real-life situations.

MA-A1-04 LINEAR & QUADRATIC FUNCTIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.3 Explain Choice of Strategies, Justify Solutions (*taught, not tested*)
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.4 Solve Problems Involving the Coordinate Plane
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.3 Graph Linear Equations, Interpret the Results
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will graph and find equations for both linear and quadratic functions.

MA-A1-04-01 – Linear Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph linear functions given the equation, and also find the equation for linear functions when given the graph. Students will also find slopes and equations of lines that are parallel or perpendicular to a given line.

MA-A1-04-02 – Quadratic Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph quadratic functions given the equation, and also find the equation for quadratic functions when given the graph. Students will also find x-intercepts and the vertex of parabolas.

MA-A1-05 FACTORING POLYNOMIALS, SOLVING QUADRATIC EQUATIONS, EXPONENTS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will factor polynomial expressions, solve quadratic equations, and simplify expressions involving exponents.

MA-A1-05-01 – Factoring Polynomials (Objective)

C-CS - Critical-Assessment at Content Standard

Students will factor polynomial expressions, including difference of squares, common factors, and trinomials with and without lead coefficients of one.

MA-A1-05-02 - Solving Quadratic Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve quadratic equations by using the quadratic formula, utilizing zero products, and examining the x-intercepts of the related function.

MA-A1-05-03 – Laws of Exponents (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify expressions using the laws of exponents. These will include multiplying powers, dividing powers, and powers of powers

MA-A1-06 DATA ANALYSIS AND PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. Students will predict outcomes by drawing reasonable inferences from data. Students will determine, collect, organize, and analyze relevant data needed to make conclusions. They will also communicate the likelihood of events using concepts from probability.

MA-A1-06-01 - Data Analysis (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. Students will predict outcomes by drawing reasonable inferences from data. They will determine, collect, organize and analyze relevant data needed to make conclusions.

MA-A1-06-02 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will communicate the likelihood of events using concepts from probability, such as evaluating simple probabilities as well as experimental vs. theoretical probability.

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Mathematics - Algebra II

Algebra II briefly reviews the topics covered in Algebra and then introduces the student to higher level topics in mathematics. Topics include linear functions, sequences, exponential functions, polynomials, systems of equations, and rational expressions.

Prerequisite: Informal Geometry, Geometry, or Intermediate Algebra; above-average grade in Informal Geometry, average grade in Geometry, or above-average grade in Intermediate Algebra. Students who do not pass semester I should transfer to Intermediate Algebra. Instructor recommendation.

Textbook: CPM Math 3 (Algebra 2)

MA-A2-01 SEQUENCES/LINEAR FUNCTIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

Students will investigate patterns to make conjectures and write algebraic representations.

The students will become familiar with patterns and graphs of functions that are multiplicative or geometric, as compared to additive or arithmetic. The students will explore functions, mainly linear, by graphing and by finding x-intercepts and y-intercepts.

MA-A2-01-01 - Sequences (Objective)

C-CS - Critical-Assessment at Content Standard

Students will investigate patterns to make conjectures and write algebraic representations.

Students will become familiar with patterns and graphs of functions that are multiplicative or geometric, as compared to additive or arithmetic.

MA-A2-01-02 - Linear Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore functions, mainly linear, by graphing and by finding x-intercepts and y-intercepts.

MA-A2-02 EXPONENTIAL FUNCTIONS/POLYNOMIALS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will use exponential functions to represent situations modeling growth and decay.

Students will also simplify and factor polynomial expressions.

MA-A2-02-01 -Exponential Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use exponential functions to represent situations modeling growth and decay.

MA-A2-02-02 - Polynomials (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify and factor polynomial expressions, focusing mainly on multiplying polynomials and factoring trinomials and differences of squares.

MA-A2-03 PARENT GRAPHS/TRANSFORMATIONS/FUNCTION NOTATION, DOMAIN, AND RANGE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will become familiar with an extended set of parent functions and their graphs. These will include the parabola, absolute value, cubic, and hyperbolic functions. Students will graph circles with the center at the origin, as well as circles that have been translated. The students will become familiar with function notation, as well as the domain and range of functions.

MA-A2-03-01 - Graphs of Functions and Transformations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will become familiar with an extended set of parent functions and their graphs. These will include the parabola, absolute value, cubic, and hyperbolic functions. Students will also graph translations and transformations of these functions, which will sometimes require completing the square to convert a quadratic function in standard form to graphing form.

MA-A2-03-02 Graphs of Circles and Transformations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph circles with the center at the origin, as well as circles that have been translated.

MA-A2-03-03 - Function Notation, Domain and Range (Objective)

C-CS - Critical-Assessment at Content Standard

Students will become familiar with function notation, as well as the domain and range of functions.

MA-A2-04 SYSTEMS OF EQUATIONS, MATRICES, EQUATIONS OF LINES (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.4 Solve Problems Involving the Coordinate Plane
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations
- MA11.4.5 Connect Algebra With Other Mathematical Topics
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will solve systems of equations and inequalities by graphing and will solve systems of equations algebraically and by using matrices. Students will set up and solve real-life application problems requiring the use of systems of equations. The students will examine how matrices can be useful to solve systems of equations and real-life applications. The students will find equations of lines given information such as two points on a line, the slope of a line, and a point, or a point on a line that is perpendicular or parallel to another line.

MA-A2-04-01 - Systems of Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve systems of equations and inequalities by graphing and will solve systems of equations algebraically and by using matrices. Students will set up and solve real-life application problems requiring the use of systems of equations.

MA-A2-04-02 - Equations of Lines (Objective)

C-CS - Critical-Assessment at Content Standard

Students will find equations of lines given information such as two points on a line, the slope of a line, and a point, or a point on a line that is perpendicular or parallel to another line.

MA-A2-05 PROBABILITY AND COUNTING PROBLEMS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.5.3 Probability Concepts to Tell Likelihood of Events
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will examine simple and conditional probability. Students will learn some general techniques for counting as well as develop formulas for permutations and combinations, and then use these techniques to solve a variety of probability problems.

MA-A2-05-01 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will examine simple and conditional probability.

MA-A2-05-02 - Counting Problems (Objective)

C-CS - Critical-Assessment at Content Standard

Students will learn some general techniques for counting as well as develop formulas for permutations and combinations, and then use these techniques to solve a variety of probability problems.

**MA-A2-06 LOGARITHMS, INVERSE FUNCTIONS/RATIONAL EQUATIONS
and EXPRESSIONS/PROPERTIES OF EXPONENTS (Content Standard)**

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will explore the logarithmic function, the inverse function for an exponential function as well as other inverse functions. The students will develop the properties of logarithms and use logarithms to solve equations and real-life applications. Students will solve rational equations and simplify rational expressions, as well as simplify expressions involving exponents.

MA-A2-06-01 - Inverse Functions and Logarithms (Objective)

C-CS - Critical-Assessment at Content Standard

Students will examine basic inverse functions and then gain an understanding of how logarithmic functions are inverses of exponential functions. The students will also explore the logarithmic function, the inverse function for an exponential function.

Students will develop the properties of logarithms and use logarithms to solve exponential equations.

MA-A2-06-02 - Rational Equations and Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve rational equations and simplify rational expressions.

MA-A2-06-03 - Properties of Exponents (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify expressions involving exponents, including rational and negative exponents.

MA-A2-07 POLYNOMIAL FUNCTIONS & COMPLEX NUMBERS (Content Standard)

Students will explore polynomial functions and their graphs, which will result in the use and understanding of imaginary and complex numbers. Roots, zeros, and x-intercepts and their relationships will be emphasized.

MA-A2-07-01 - Polynomial Functions (Objective)

T - Teach

The students will explore polynomial functions and their graphs, which will result in the use and understanding of imaginary and complex numbers. Roots, zeros, and x-intercepts and their relationships will be emphasized.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics - Algebra A

Algebra A and Algebra B will satisfy the district requirement for Algebra I

This is an introductory course in Algebra. I. The CPM materials will be used. The use of variables, signed numbers, exponents, and radicals will be developed. Students will be engaged in problems involving linear equations, algebraic expression, proportional reasoning, and data analysis.

Prerequisite: Foundations for Algebra or Pre-Algebra. Credit may not be earned in both Algebra I and Algebra A; instructor recommendation only.

Textbook: CPM Math 1, 2nd Edition, Volume 1,

MA-AA-01 ALGEBRAIC EXPRESSIONS and AREA (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will solve real-life problems involving the area of irregular shapes and circles by using sub-problems and evaluating algebraic expressions. The students simplify algebraic expressions by using the distributive property and combining like terms.

MA-AA-01-01 - Simplify and Evaluate Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify algebraic expressions by using the distributive property and combining like terms.

MA-AA-01-02 - Area and Perimeter Problems (Objective)

C-CS - Critical-Assessment at Content Standard

Students will find the area, perimeter, and/or circumference of polygons, irregular shapes, and circles. Real-life problems will be solved using these skills.

MA-AA-02 GRAPHING LINEAR EQUATIONS; PROBLEM SOLVING (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.2.4 Solve Problems Involving the Coordinate Plane
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills

- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.3 Graph Linear Equations, Interpret the Results
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will graph linear equations, including several which represent real-life data. Graphing calculators will be introduced. Students will also use guess-and-check tables to set up and solve problems.

MA-AA-02-01 - Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph linear equations and interpret the results in solving algebra problems.

MA-AA-02-02 - Problem Solving (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use guess-and-check tables as a problem solving strategy involving real-life situations.

MA-AA-03 SOLVING LINEAR EQUATIONS and PROBLEM SOLVING (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will solve multi-step equations including equations with variables on both sides and equations that require using the distributive property and combining like terms. The students will guess-and-check tables in order to write equations from problem solving situations.

MA-AA-03-01 - Solving Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve multi-step equations including equations with variables on both sides, and equations that require using the distributive property and combining like terms.

MA-AA-03-02 - Problem Solving (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use guess-and-check tables in order to write (and then solve) equations from real-life situations.

MA-AA-04 PROPORTIONAL REASONING (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.3 Identify/Apply Scale, Ratio, Proportion
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will use proportional reasoning to solve real-life problems. The problems will include enlarging and reducing geometric figures, conversions in both English and metric units of measure, percent problems, and finding lengths of corresponding sides of similar figures.

MA-AA-04-01 - Ratios and Proportions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will write ratios given information, and will use proportional reasoning to solve real-life problems. These problems include enlarging and reducing geometric figures, conversions in both English and metric units of measure, percent problems, and finding lengths of corresponding sides of similar figures.

MA-AA-05 DATA ANALYSIS and PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. They will predict outcomes by drawing reasonable inferences from data. Students will determine, collect, organize, and analyze relevant data needed to make conclusions, and they will communicate the likelihood of events using concepts from probability.

MA-AA-05-01 - Data Analysis (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. They will predict outcomes by drawing reasonable inferences from data. Students will determine, collect, organize, and analyze relevant data needed to make conclusions.

MA-AA-05-02 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will communicate the likelihood of events using concepts from probability such as evaluating simple probabilities as well as experimental vs. theoretical probabilities.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics - Algebra B

Algebra A and Algebra B will satisfy the district requirement for Algebra I

Algebra B will allow students to build on their knowledge of Algebra. Focus will be on linear equations, polynomials, quadratic equations, exponential expressions, and data analysis. This course, along with Algebra A fulfills the Algebra I graduation requirement.

Prerequisite: Algebra A; Credit may not be earned in both Algebra I and Algebra B; instructor recommendation.

Textbook: CPM Math 1, 2nd Edition, Volume 2

MA-AB-01 GRAPHING LINEAR EQUATIONS, SYSTEMS OF EQUATIONS (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.4 Solve Problems Involving the Coordinate Plane
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.3 Graph Linear Equations, Interpret the Results
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations

Students will graph linear equations using the concept of slope and y-intercept. They will solve systems of equations by graphing or using substitution.

MA-AB-01-01 - Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will graph and analyze linear equations using the concepts of slope and y-intercept.

MA-AB-01-02 - Solving Systems of Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve systems of equations by using substitution. They will set up and solve real-life problems by using graphing to solve systems of linear equations.

MA-AB-02 MULTIPLYING BINOMIALS, FACTORING POLYNOMIALS, SOLVING QUADRATIC EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will gain a deeper understanding of polynomials by multiplying binomials, factoring trinomials, and solving quadratic equations by factoring.

MA-AB-02-01 - Multiplying Binomials (Objective)

C - Critical--Assessment Reporting Required

Students will multiply binomials. This will include the use of algebra tiles to further students' understanding of multiplying polynomials through the area model.

MA-AB-02-02 - Factoring (Objective)

C-CS - Critical-Assessment at Content Standard

Students will factor polynomials including common factors, difference of two squares, and trinomials. The use of "diamond" problems and algebra tiles will be used to further students' understanding of factoring.

MA-AB-02-03 - Solving Quadratic Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve quadratic equations by factoring and using "zero products."

MA-AB-03 PYTHAGOREAN THEOREM, EQUATIONS OF LINES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will apply the Pythagorean Theorem to solve real-life problems and to find the distance between two points. The students will also write equations of a line given the information about the line.

MA-AB-03-01 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply the Pythagorean Theorem to solve real-life problems and to find the distance between two points.

MA-AB-03-02 - Equations of Lines (Objective)

C-CS - Critical-Assessment at Content Standard

Students will write equations of a line given information about the line, such as the slope and a point on the line, two points on the line, or the graph of a line.

MA-AB-04 EXPONENTIAL EXPRESSIONS, QUADRATIC FORMULA (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will simplify exponential expressions using the basic properties of exponents. They will solve quadratic equations using the quadratic formula.

MA-AB-04-01 - Exponential Expressions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify exponential expressions using the properties of exponents, including multiplying and dividing powers, and powers of powers.

MA-AB-04-02 - Quadratic Formula (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve quadratic equations using the quadratic formula.

MA-AB-05 DATA ANALYSIS AND PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. Students will predict outcomes by drawing reasonable inferences from data. They will determine, collect, organize, and analyze relevant data needed to make conclusions, and they will communicate the likelihood of events using concepts from probability.

MA-AB-05-01 - Data Analysis (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply knowledge of mean, median, mode, and range to interpret and evaluate information and data. Students will predict outcomes by drawing reasonable inferences from data. They will determine, collect, organize, and analyze relevant data needed to make conclusions.

MA-AB-05-02 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will communicate the likelihood of events using concepts from probability, such as evaluating simple probabilities as well as experimental vs. theoretical probability.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics - Accelerated Algebra II

Accelerated Algebra II briefly reviews the topics covered in Algebra I and then introduces the student to higher-level topics in mathematics. Topics include investigating functions, sequences, polynomials, systems of equations, matrices, rational expressions, logarithms, complex numbers, quadratic equations, conics, and trigonometry. Accelerated Algebra II is accelerated and more intense as compared to regular Algebra II and covers more topics at a quicker pace. Students must have passed Geometry before enrolling in this course.

Prerequisite: Above-average grade in Geometry and Algebra I; recommended for college bound students, students who receive a grade lower than a “C” for semester I should transfer to regular Algebra II for semester II. Instructor recommendation – this course is a highly rigorous course which will continue the use of CPM materials.

Textbook: CPM Math 3 (Algebra 2)

MA-AX-01 SEQUENCES AND FUNCTIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will investigate patterns to make conjectures and write algebraic representations.

Students will become familiar with patterns and graphs of functions that are multiplicative or geometric, as compared to additive or arithmetic. The students will explore functions, mainly linear and quadratic, by graphing, by finding x-intercepts and y-intercepts, and by stating domain and range. They will also become familiar with function notation.

MA-AX-01-01 - Sequences (Objective)

C-CS - Critical-Assessment at Content Standard

Students will investigate patterns to make conjectures and write algebraic representations.

The students will become familiar with patterns and graphs of functions that are multiplicative or geometric, as compared to additive or arithmetic.

MA-AX-01-02 - Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore functions, mainly linear and quadratic, by graphing, by finding x-intercepts and y-intercepts, and by stating domain and range. They will also become familiar with function notation.

MA-AX-02 EXPONENTIAL FUNCTIONS; PROPERTIES OF EXPONENTS (Content Std.)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use exponential functions to represent situations modeling growth and decay. Students will also simplify expressions involving integer and rational exponents by applying their knowledge of property of exponents.

MA-AX-02-01 - Exponential Functions (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use exponential functions to represent situations modeling growth and decay.

MA-AX-02-02 - Property of Exponents (Objective)

C-CS - Critical-Assessment at Content Standard

Students will simplify expressions involving integer and rational exponents by applying their knowledge of property of exponents.

MA-AX-03 PARENT GRAPHS AND TRANSFORMATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA-11-01-01 Represent/Apply Real Numbers in a Variety of Forms
- MA-11-02-01 Use Geometry Concepts to Solve Problems
- MA-11-02-02 Communicate Using Mathematical Language
- MA-11-02-05 Connect Geometry With Other Mathematical Topics
- MA-11-04-02 Write/Model/Evaluate Algebra Concepts
- MA-11-04-05 Connect Algebra With Other Mathematical Topics

Students will become familiar with an extended set of parent functions and their graphs. These will include parabola, absolute value, cubic, and hyperbolic functions. Students will also graph translations and transformations of these functions. Students will also graph circles with the center at the origin, as well as circles that have been translated.

MA-AX-03-01 - Graphs of Functions and Transformations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will become familiar with an extended set of parent functions and their graphs.

These will include parabola, absolute value, cubic, and hyperbolic functions. Students will also graph translations and transformations of these functions, which will sometimes require completing the square to convert a quadratic function in standard form to graphing form.

MA-AX-03-02 - Graphs of Circles and Transformations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will also graph circles with the center at the origin, as well as circles that have been translated.

MA-AX-04 SYSTEMS OF EQUATIONS AND MATRICES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.2 Apply Structure/Properties of Real Number System

- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations
- MA11.4.5 Connect Algebra With Other Mathematical Topics
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will solve systems of equations and inequalities by graphing, and they will solve systems of equations algebraically and using matrices. Students will set up and solve real-life application problems requiring the use of systems of equations. The students will perform operations on matrices, both by hand and with calculators. Students will examine how matrices can be useful to solve systems of equations and real life applications.

MA-AX-04-01 - Systems of Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will solve systems of equations and inequalities by graphing, and they will solve systems of equations algebraically and using matrices. Students will set up and solve real-life application problems requiring the use of systems of equations.

MA-AX-04-02 - Matrices (Objective)

C-CS - Critical-Assessment at Content Standard

Students will perform operations on matrices, both by hand and with calculators. Students will examine how matrices can be useful to solve systems of equations and real life applications.

MA-AX-05 LOGARITHMS AND INVERSE FUNCTIONS (Content Standard)

T - Teach

State Standard and Benchmark Correlation:

- **MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms*
- **MA11.1.2 Apply Structure/Properties of Real Number System*
- **MA11.4.1 Use Algebraic Concepts, Symbols, Skills*
- **MA11.4.2 Write/Model/Evaluate Algebra Concepts*

Students will explore the logarithmic function, the inverse function for an exponential function, as well other inverse functions. The students will develop the properties of logarithms and use logarithms to solve equations and real-life applications.

MA-AX-05-01 - Inverse Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will examine basic inverse functions and then gain an understanding of how logarithmic functions are inverses of exponential functions.

MA-AX-05-02 - Logarithms (Objective)

C-NR - Critical-District Reporting Not Required

Students will explore the logarithmic function and the inverse function for an exponential function. Students will develop the properties of logarithms and use logarithms to solve equations and real-life applications.

MA-AX-06 POLYNOMIALS AND CIRCULAR FUNCTIONS (Content Standard)

T- Teach

State Standard and Benchmark Correlation:

- **MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms*
- **MA11.2.1 Use Geometry Concepts to Solve Problems*

***MA11.3.1 Apply Appropriate Units/Methods of Measurement*

Students will explore polynomial functions and their graphs, which will result in the use and understanding of imaginary and complex numbers. Roots, zeros, and x-intercepts and their relationships will be emphasized. The students will become familiar with sine and cosine function and make transformations on these graphs to model a variety of situations. The students will also gain an understanding of radian and degree measurement.

MA-AX-06-01 - Polynomial Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will explore polynomial functions and their graphs, which will result in the use and understanding of imaginary and complex numbers. Roots, zeros, and x-intercepts and their relationships will be emphasized.

MA-AX-06-02 - Circular Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will use a circle to create cyclic curves, become familiar with the parent graphs for the sine and cosine functions, and make transformations on these graphs to model a variety of situations. The students will also gain an understanding of radian and degree measurement.

MA-AX-07 PROBABILITY AND COUNTING PROBLEMS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use tree and area diagrams to represent the multiplication of probabilities expressed as fractions, decimals, and percents. Tree and area diagrams will also be used to model problems of conditional probability. Students will also compute expected values and determine whether games are fair, and they will apply matrices to probability. The students will also learn some general techniques for counting as well as develop formulas for permutations, and then use these techniques to solve a variety of probability problems.

MA-AX-07-01 - Probability (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use tree and area diagrams to represent the multiplication of probabilities expressed as fractions, decimals, and percents. Tree and area diagrams will also be used to model problems of conditional probability. Students will also compute expected values and determine whether games are fair, and they will apply matrices to probability.

MA-AX-07-02 - Counting Problems (Objective)

C-CS - Critical-Assessment at Content Standard

Students will learn some general techniques for counting as well as develop formulas for permutations, and then use these techniques to solve a variety of probability problems.

Campbell County School District # 1
Gillette, Wyoming

Mathematics - Geometry

This course studies two- and three-dimensional figures and the relationships between them. The student will formulate and study axioms, postulates, and theorems related to logical proofs and then apply their use in solving problems. The study of both coordinate and transformational geometry will be included. Students will be actively involved in hands-on and computer investigations whenever possible. Mathematical reasoning, connections, and communications will be stressed.

Prerequisite: Algebra I or Algebra A and Algebra B; instructor recommendation. Credit may not be earned in both Geometry and Informal Geometry.

Textbook: CPM Math 2, 2nd Edition - Geometry

MA-GM-01 2-D FIGURES; GRAPHING LINEAR EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will find the area and perimeter of quadrilaterals and triangles, and they will apply the Pythagorean Theorem to find the length of the legs or hypotenuse of a right triangle. Students will also graph linear equations.

MA-GM-01-01 - Area and Perimeter (Objective)

C-CS - Critical-Assessment at Content Standard

Students will know and apply basic formulas to find the areas of two-dimensional figures such as triangles, rectangles, parallelograms, trapezoids, and irregular shapes. Students will also find the perimeter of these figures.

MA-GM-01-02 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply the Pythagorean Theorem to find the length of the hypotenuse or leg of a right triangle. The students will apply the Pythagorean Theorem in various types of problem-solving situations as well as to find the distance between two points on the coordinate axis system.

MA-GM-01-03 - Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore relationships between points on a straight line leading to an understanding of and ability to use slope and y-intercept to graph linear equations.

MA-GM-02 ANGLE RELATIONSHIPS; PATTERN DEVELOPMENT (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics
- MA11.5.3 Probability Concepts to Tell Likelihood of Events

Students will develop the fundamental vocabulary for angles and angle relationships, investigate angle relationships formed by parallel lines and transversals, and also investigate interior and exterior angles in triangles. Students will develop the problem-solving skills of looking for patterns, making tables and systematic lists of data, and drawing diagrams.

MA-GM-02-01 - Angle Relationships (Objective)

C-CS - Critical-Assessment at Content Standard

Students will develop the fundamental vocabulary for angles and angle relationships, investigate angle relationships formed by parallel lines and transversals, and also investigate interior and exterior angles in triangles.

MA-GM-02-02 - Pattern Recognition (Objective)

C-CS - Critical-Assessment at Content Standard

Students will develop the problem-solving skills of looking for patterns, making tables and systematic lists of data, and drawing diagrams.

MA-GM-03 3-D FIGURES; CONGRUENT FIGURES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will explore visualization activities of three-dimensional figures such as prisms and pyramids and will draw isometric representations of cube stacks. The students will calculate the surface area and volume of prisms and pyramids. Students will also discover and use the conditions under which pairs of triangles must be congruent, and they will investigate translations of polygons. Students will prove that parts of triangles and quadrilaterals are congruent to corresponding parts of other triangles and quadrilaterals.

MA-GM-03-01 - 3-Dimensional Figures (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore visualization activities of three-dimensional figures such as prisms and pyramids and will draw isometric representations of cube stacks. The students will calculate the surface area and volume of prisms and pyramids.

MA-GM-03-02 - Congruent Figures (Objective)

C-CS - Critical-Assessment at Content Standard

Students will discover and use the conditions under which pairs of triangles must be congruent, and they will investigate translations of polygons. Students will prove that parts of triangles and quadrilaterals are congruent to corresponding parts of other triangles and quadrilaterals.

MA-GM-04 TRIGONOMETRY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.1.4 Use Proportional Reasoning to Solve Problems

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.3 Identify/Apply Scale, Ratio, Proportion

MA11.3.4 Solve Problems of Angle Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will demonstrate the effective use of trigonometric ratios, the Pythagorean theorem, Law of Sines, and special right triangle relationships to solve for the lengths of sides and angle measure of triangles.

MA-GM-04-01 - Trigonometric Ratios and Law of Sines (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply the basic trigonometric ratios (sine, cosine, and tangent) to solve right triangle applications, and the Law of Sines to solve oblique triangle applications.

MA-GM-04-02 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply the Pythagorean theorem to solve right triangle applications.

MA-GM-04-03 - Special Right Triangles (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply properties of special right triangles to solve problems. Special triangles will include 30-60-90 triangles, and 45-45-90 triangles. Problems will include finding the lengths of the sides and the angle measure of special right triangles.

MA-GM-05 SIMILARITY AND POLYGONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.3 Identify/Apply Scale, Ratio, Proportion
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will explore properties of figures with the same shape, discover the basic theorems for similarity, and apply them to triangles. The students will discover the basic relationships and formulas for interior and exterior angles of polygons and will also explore the properties of quadrilaterals.

MA-GM-05-01 - Similarity (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore properties of figures with the same shape, discover the basic theorems for similarity, and apply them to triangles.

MA-GM-05-02 - Polygons and Quadrilaterals (Objective)

C-CS - Critical-Assessment at Content Standard

Students will discover the basic relationships and formulas for interior and exterior angles of polygons and will also explore the properties of quadrilaterals.

MA-GM-06 CIRCLES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will learn and apply the fundamental properties and relationships for circles, including arcs, angles, tangents, secants, chords, diameters, and radii. Students will also apply their knowledge of circumference and area of circles to find arc length and areas of sectors.

MA-GM-06-01 - Fundamental Properties of Circles (Objective)

C-CS - Critical-Assessment at Content Standard

Students will learn and apply the fundamental properties and relationships for circles, including arcs, angles, tangents, secants, chords, diameters, and radii.

MA-GM-06-02 - Arc Length and Area of Sectors (Objective)

C-CS - Critical-Assessment at Content Standard

Students will also apply their knowledge of circumference and area of circles to find arc length and areas of sectors.

last update 6/17/2009

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Campbell County School District # 1
Gillette, Wyoming

Mathematics - Informal Geometry

Informal Geometry will extend the problem solving used in Algebra A and B to include problems specifically centering on the geometry area. Because the Algebra A and B strand of the curriculum is integrated, the problems will naturally use algebra and data analysis. The students will investigate linear equations, two- and three-dimensional figures, angle relationships, and trigonometry.

Prerequisite: Algebra B or Algebra I. Rigid requirement: students may not enter this class until their district Algebra I requirement is met; credit may not be earned in both Informal Geometry and Geometry, instructor recommendation.

Textbook: CPM Math 2, 2nd Edition - Geometry, Volume 1

MA-GN-01 2-D FIGURES; GRAPHING LINEAR EQUATIONS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will find the area and perimeter of quadrilaterals and triangles, and they will apply the Pythagorean theorem to find the length of the legs or hypotenuse of a right triangle. Students will also graph linear equations.

MA-GN-01-01 - Area and Perimeter (Objective)

C-CS - Critical-Assessment at Content Standard

Students will know and apply the basic formulas to find the areas of two-dimensional figures such as triangles, rectangles, parallelograms, trapezoids, and irregular shapes. Students will also find the perimeter of these figures.

MA-GN-01-02 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply the Pythagorean Theorem to find the length of the hypotenuse or leg of a right triangle. Students will apply the Pythagorean theorem in various types of problem-solving situations as well as to find the distance between two points on the coordinate axis system.

MA-GN-01-03 - Graphing Linear Equations (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore relationships between points on a straight line leading to an understanding of and ability to use slope and y-intercept to graph linear equations.

MA-GN-02 ANGLE RELATIONSHIPS; PATTERN DEVELOPMENT (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.4 Solve Problems of Angle Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will develop the fundamental vocabulary for angles and angle relationships, investigate angle relationships formed by parallel lines and transversals, and investigate interior and exterior angles in triangles. Students will develop the problem-solving skills of looking for patterns, making tables and systematic lists of data, and drawing diagrams.

MA-GN-02-01 - Angle Relationships (Objective)

C-CS - Critical-Assessment at Content Standard

Students will develop the fundamental vocabulary for angles and angle relationships, investigate angle relationships formed by parallel lines and transversals, and investigate interior and exterior angles in triangles.

MA-GN-02-02 - Pattern Recognition (Objective)

C-CS - Critical-Assessment at Content Standard

Students will develop the problem-solving skills of looking for patterns, making tables and systematic lists of data, and drawing diagrams.

MA-GN-03 3-D FIGURES; CONGRUENT FIGURES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will explore visualization activities of three-dimensional figures such as prisms and pyramids, and they will draw isometric representations of cube stacks. Students will calculate the surface area and volume of prisms and pyramids. Students will also discover and use the conditions under which pairs of triangles must be congruent, and they will investigate translations of polygons. Students will prove that parts of triangles and quadrilaterals are congruent to corresponding parts of other triangles and quadrilaterals.

MA-GN-03-01 - Three-Dimensional Figures (Objective)

C-CS - Critical-Assessment at Content Standard

Students will explore visualization activities of three-dimensional figures such as prisms and pyramids, and they will draw isometric representations of cube stacks. Students will calculate the surface area and volume of prisms and pyramids.

MA-GN-03-02 - Congruent Figures (Objective)

C-CS - Critical-Assessment at Content Standard

Students will also discover and use the conditions under which pairs of triangles must be congruent, and they will investigate translations of polygons. Students will prove that parts of triangles and quadrilaterals are congruent to corresponding parts of other triangles and quadrilaterals.

MA-GN-04 TRIGONOMETRY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.1.4 Use Proportional Reasoning to Solve Problems

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.3 Identify/Apply Scale, Ratio, Proportion

MA11.3.4 Solve Problems of Angle Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will demonstrate the effective use of trigonometric ratios, the Pythagorean theorem, and special right triangle relationships to solve for the lengths of sides and angle measure of right triangles.

MA-GN-04-01 - Trigonometric Ratios (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply the basic trigonometric ratios (sine, cosine, and tangent) to solve right triangle applications.

MA-GN-04-02 - Pythagorean Theorem (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply the Pythagorean theorem to solve right triangle applications.

MA-GN-04-03 - Special Right Triangles (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and/or apply properties of special right triangles to solve problems. Special triangles will include 30-60-90 triangles, and 45-45-90 triangles. Problems will include finding the lengths of the sides and the angle measure of special right triangles.

Campbell County School District # 1

Gillette, Wyoming

Mathematics - Consumer & Financial Math

Students will apply mathematics to problems centered on personal business and financial skills. Topics will include income, banking and charge accounts, loans, and purchasing, among others. Students will use and apply data analysis skills in decision making. Students will use appropriate software for maintaining final records.

Prerequisite: Geometry or Informal Geometry may be taken concurrently, instructor recommendation.

Textbook: Mathematics With Business Applications, 4th Edition (Glencoe-McGraw/Hill)

MA-CF-01 INCOME (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will explore how mathematics affects consumers and their personal finances. Topics will include, but are not limited to, wages, taxes, banking, and record keeping.

MA-CF-01-01 - Gross and Net Income (Objective)

C-NR - Critical-District Reporting Not Required

Students will calculate wages earned through straight time, overtime, piecework, fixed salaries, and commissions. They will compute net income by calculating deductions for federal and state income tax, social security tax, and insurance.

MA-CF-01-02 - Checking and Savings Accounts (Objective)

C-NR - Critical-District Reporting Not Required

Students will compute the account balance in a check register and reconcile the check register and bank statement. They will complete savings account deposit and withdrawal slips and calculate interest.

MA-CF-02 EXPENDITURES (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will explore how effective decision making about personal expenditures affects their lives. Topics will include, but are not limited to, cash expenditures, loans, purchasing, homes and cars, charge accounts, and credit cards.

MA-CF-02-01 - Cash Purchases (Objective)

C-NR - Critical-District Reporting Not Required

Students will compute sales tax, total purchase price, unit price, markdown, and sale price on selected items.

MA-CF-02-02 - Loans (Objective)

C-NR - Critical-District Reporting Not Required

Students will compute maturity value, interest rate, proceeds, amount financed, finance charge, and annual percentage rate on loans.

MA-CF-02-03 - Large Purchases (Objective)

C-NR - Critical-District Reporting Not Required

Students will explore the costs and process used to purchase autos, homes, or other large purchases.

MA-CF-02-04 - Charge Accounts and Credit Cards (Objective)

C-NR - Critical-District Reporting Not Required

Students will compute new balance and finance charges from charge accounts.

MA-CF-03 FINANCIAL PLANNING (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will explore financial planning for the future by studying insurance and retirement plans.

MA-CF-03-01 - Insurance (Objective)

C-NR - Critical-District Reporting Not Required

Students will examine insurance plans and costs associated with them.

MA-CF-03-02 - Retirement Planning (Objective)

C-NR - Critical-District Reporting Not Required

Students will examine retirement plans, values attained at retirement, and monthly contributions.

MA-CF-04 STATISTICS: CALCULATIONS & ANALYSIS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will analyze, interpret, and present data information.

MA-CF-04-01 - Collecting and Organizing Data (Objective)

C-NR - Critical-District Reporting Not Required

Students will collect and organize data into tallies, frequency tables, bar graphs, histograms, line graphs, and circle graphs, making use of appropriate technology.

MA-CF-04-02 - Statistical Calculations (Objective)

C-NR - Critical-District Reporting Not Required

Students will find the mean, median, mode, and range and determine the best measure of central tendency for a set of data.

Campbell County School District # 1
Gillette, Wyoming

Math - Calculus I

Calculus I is the study of functions, graphs, limits, and the techniques and applications of differentiation and integration of algebraic, trigonometric, and logarithmic functions. Some of the applications include: finding the area under a curve, the area between two curves, distances, volumes, length of a plane curve, area of a surface of revolution, average value of a function, and moments and center of mass.

Prerequisite: B- or higher grade in Pre-Calculus with Trigonometry or Accelerated Pre-Calculus; conditional entry with average grade in Pre-Calculus with Trigonometry; students who do not pass semester I should not take semester II; instructor recommendation required.

Textbook: Calculus of a Single Variable (Houghton Mifflin)

Advanced Designation Course - Mathematics

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Mathematics content area.

Students at the advanced level in Mathematics utilize or synthesize information to make complex mathematical connections. They apply concepts, skills, strategies, and tools/technology to efficiently solve problems. Students provide valid and convincing evidence that justifies the procedures, solutions, and inferences. They communicate reasoning and solutions using coherent and clear mathematical language.

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

MA-CL-01 FUNCTIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.2.1 Use Geometry Concepts to Solve Problems

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will understand and apply definitions and theorems of the limit of a function and concepts of continuity, and they will identify properties of continuous functions.

MA-CL-01-01 - Properties of Equations and Inequalities (Objective)

R - Reinforce

Students will associate pairs of numbers (x,y) with points on a plane, find the distance between these points, find the slope and equation of a straight line, solve inequalities using absolute values, and understand the concept of interval and neighborhood.

MA-CL-01-02 - Algebraic and Trigonometric Functions (Objective)

R - Reinforce

Students will define a function, recognize equal functions, graph a function in two variables, and work with composition functions.

MA-CL-01-03 - Find Limits (Objective)

C-NR - Critical-District Reporting Not Required

Students will understand and apply definitions and theorems of the limit of a function as they approach constants.

MA-CL-01-04 - Continuous Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will define and apply the concepts of continuity and will identify properties of continuous functions.

MA-CL-02 DERIVATIVES AND THEIR APPLICATION (Content Standard)

State Standard and Benchmark Correlation:

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will understand how to find the derivative of a function with all basic differentiation techniques. The students will apply the differentiation to mathematical applications such as graphing and equation of the tangent line, and real-life situations such as economics, velocity, acceleration, and optimization.

MA-CL-02-01 - Find Derivatives (Objective)

C-NR - Critical-District Reporting Not Required

Students will find the first, second, and higher order derivatives and will apply the method of implicit differentiation. They will be able to find the slope of a curve at any given point and recognize this slope as the derivative of the function, and apply these ideas to problems associated with velocities and acceleration.

MA-CL-02-02 - Find Differentials (Objective)

C-NR - Critical-District Reporting Not Required

Students will find differentials "dx" and "dy", differentiate the basic trigonometric functions, and find position, velocity, and acceleration.

MA-CL-02-03 - Applications of Second Derivatives (Objective)

C-NR - Critical-District Reporting Not Required

Students will graph functions using the ideas of increasing and decreasing relative extreme, points of inflection and concavity; they will be able to apply derivatives to solve problems involving rates of change and approximation using Newton's method.

MA-CL-03 INTEGRALS AND THEIR APPLICATION (Content Standard)

State Standard and Benchmark Correlation:

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will understand how to find the integral of a function with all basic integration techniques. The students will apply integration to mathematical concepts such as area between curves, volume of solids, and solving problems involving work. Students will be able to find the arc length and surface area of a solid revolution.

MA-CL-03-01 - Evaluate Definite Integrals (Objective)

C-NR - Critical-District Reporting Not Required

Students will find the indefinite integral and apply it to velocities, and he will find the area under a curve.

MA-CL-03-02 - Apply Indefinite Integrals (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to find the indefinite integral and apply it to velocities and find the area under a curve.

MA-CL-03-03 - Solve Problems With Integration (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to find the area between two curves, volumes of solids by several methods, the length of a plane curve, the area of a surface of revolution, the average value of function, moments and centers of mass, and apply integrals to solving problems with work.

MA-CL-03-04 - Integration Formulas (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to integrate using special formulas.

MA-CL-03-05 - Integration by Parts (Objective)

C-NR - Critical-District Reporting Not Required

Given equations by parts, the students will be able to integrate.

MA-CL-04 TRIG/LOG FUNCTIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will be able to apply differentiation and integration to trigonometric and logarithmic functions and their inverses.

MA-CL-04-01 Derivatives of Logarithms, Exponential Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to determine and apply derivatives of logarithms.

MA-CL-04-02 - Integrate Logarithms (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to determine and apply integrations of logarithms.

MA-CL-04-03 - Sine and Cosine (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to apply and determine trig functions and inverse trig functions.

MA-CL-04-04 - Derivatives of Inverse Trig Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to determine and apply derivatives and integrals of trig functions.

Campbell County School District # 1 Gillette, Wyoming

Mathematics - Pre-Calculus with Trig

Pre-Calculus with Trigonometry is designed to prepare the student for Calculus. Calculus requires a good command of algebraic skills. A portion of this class will concentrate on the improvement and extension of these skills, including polynomial equation theory and vector theory. The six trigonometric functions, their inverses, their graphs, right triangles, and other triangle applications will be studied.

Prerequisite: B- or higher grade recommended in Algebra II; recommended for college-bound students; instructor recommendation required.

Textbook: Advanced Mathematical Concepts

Advanced Designation Course - Mathematics

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Mathematics content area.

Students at the advanced level in Mathematics utilize or synthesize information to make complex mathematical connections. They apply concepts, skills, strategies, and tools/technology to efficiently solve problems. Students provide valid and convincing evidence that justifies the procedures, solutions, and inferences. They communicate reasoning and solutions using coherent and clear mathematical language.

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

MA-CT-01 FUNCTIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.2.4 Solve Problems Involving the Coordinate Plane

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will identify, graph, and evaluate functions. The students will use a graphing calculator and computer appropriately.

MA-CT-01-01 - Inverse Functions (Objective)

S - Supporting

Students will identify, find, and graph inverse functions.

MA-CT-01-02 - Zeros of Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will find zeros of polynomial functions.

MA-CT-01-03 - Rational Functions and Their Graphs (Objective)

C-NR - Critical-District Reporting Not Required

Students will, by the use of technology, graph rational functions and their asymptotes.

MA-CT-01-04 - Exponential Functions and Their Graphs (Objective)

S - Supporting

Students will graph and use exponential functions.

MA-CT-01-05 - Common and Natural Logarithmic Functions (Objective)

S - Supporting

Students will compute logarithms, solve logarithmic equations, and apply these functions to problem solving situations.

MA-CT-02 MATRICES (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will solve matrices and perform operational procedures. The student will use a graphing calculator and computer appropriately.

MA-CT-02-01 - Systems of Equations (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve systems of second- and higher-degree equations by such strategies as Gaussian elimination, etc.

MA-CT-02-02- Matrices, Inverses, Determinants (Objective)

C-NR - Critical-District Reporting Not Required

Students will perform addition, subtraction, and multiplication with matrices; find inverses and determinants of matrices; and apply these skills in problem-solving situations.

MA-CT-02-03 - Graph Theory (Objective)

S - Supporting

Students will apply matrices to graph theory.

MA-CT-03 TRIGONOMETRIC FUNCTIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.3.4 Solve Problems of Angle Measurement

Students will simplify and evaluate radian/degree conversions and trig functions with graphing. The students will use a graphing calculator and computer appropriately.

MA-CT-03-01 - Degree and Radian Measure (Objective)

C-NR - Critical-District Reporting Not Required

Students will convert radians to degrees and vice versa including finding the arc length generated by an angle.

MA-CT-03-02 - Six Trigonometric Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will understand the definitions and find the values of sine, cosine, tangent, cotangent, secant, and cosecant.

MA-CT-03-03 - Inverse Trigonometric Functions (Objective)

S - Supporting

Students will understand and use the inverse trigonometric functions.

MA-CT-04 PROBLEM SOLVING (Content Standard)

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.1.4 Use Proportional Reasoning to Solve Problems
- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.3 Identify/Apply Scale, Ratio, Proportion
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will employ trig ratios to solve real-life triangle scenarios.

MA-CT-04-01 - Right Triangle Solutions/Applications (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve for missing parts of right triangles and apply the trigonometric ratios in problem solving situations.

MA-CT-04-02 - Law of Sines/Law of Cosines (Objective)

C-NR - Critical-District Reporting Not Required

Students will recognize and apply the Law of Sines and the Law of Cosines.

MA-CT-04-03 - Vectors (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve real-life problems, such as two forces acting upon one object, using vectors.

MA-CT-05 - TRIGONOMETRIC IDENTITIES AND GRAPHS (Content Standard)

State Standard and Benchmark Correlation:

- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will use and derive trig identities and their applications.

MA-CT-05-01 - Trigonometric Identities (Objective)

C-NR - Critical-District Reporting Not Required

Students will know some basic trigonometric identities and will use them to derive or prove other identities.

MA-CT-05-02 - Trigonometric Equations (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve trigonometric equations.

MA-CT-05-03 - Graphs of the Six Trigonometric Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will graph the six trigonometric functions.

MA-CT-06 DISCRETE MATHEMATICS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will simplify and evaluate sequences, series, permutations, combinations, and probability.

MA-CT-06-01 - Permutations, Combinations, Probability (Objective)

S - Supporting

Students will solve problems which involve permutations, combinations, and probability.

MA-CT-06-02 - Sequences and Series (Objective)

S - Supporting

Students will write sequences, find missing terms of sequences, and find the sum of mathematical series.

MA-CT-07 POLAR COORDINATES (Content Standard)

State Standards and Benchmark Correlations:

MA11.2.2 Communicate Using Mathematical Language

MA11.2.5 Connect Geometry With Other Mathematical Topics

Students will represent points in a plane on a polar coordinate system, graph polar equations, and express complex numbers in polar form; they will use the polar form of a complex number to compute powers and roots.

MA-CT-07-01 - Polar Coordinates (Objective)

S - Supporting

Students will represent points in a plane on a polar coordinate system, graph polar equations, and express complex numbers in polar form.

MA-CT-07-02 - Complex Numbers/DeMoivre's Theorem (Objective)

S - Supporting

Students will use the polar form of a complex number to compute powers and roots.

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Campbell County School District # 1

Gillette, Wyoming

Mathematics - DISCRETE MATH (1 Semester)

Students will apply a variety of problem-solving procedures, mathematical thinking, and reasoning to solve problems involving discrete mathematics. Topics include problems in fair division, election methods, scheduling, paths, networks, and graph models. Students will solve problems from diverse areas involving social choice, economics, physical sciences, business, and mathematics. The use of appropriate technology and software to solve mathematical problems will be stressed.

Prerequisite: Geometry or Informal Geometry; for students planning post secondary education in fields with less rigorous math requirements.

Textbook: Discrete Mathematics Through Applications (Freeman)

MA-DM-01 DISCRETE MATH AND SOCIAL CHOICE (Content Standard)

State Standard and Benchmark Correlation:

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will explore the ideas and strategies for solving problems which occur within the categories of dividing estates and elections.

MA-DM-01-01 - Fair Division (Objective)

C-NR - Critical-District Reporting Not Required

Students will explore the concept of dividing objects fairly as applied to the division of food among children, estates among heirs, and seats in a governmental body.

MA-DM-01-02 - Election Methods (Objective)

C-NR - Critical-District Reporting Not Required

Students will examine different ways of combining individual preferences into a single result by applying group ranking methods and algorithms to elections.

MA-DM-02 DISCRETE GRAPHS AND APPLICATIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.5 Connect Algebra With Other Mathematical Topics

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use different types of discrete graphs to solve problems involving the economy, computer science, the natural and physical sciences, and mathematics.

MA-DM-02-01 - Vocabulary and Representation (Objective)

C-NR - Critical-District Reporting Not Required

Students will use the vocabulary of discrete graphs as applied to problem solving in the areas of critical paths, minimum project time, and scheduling problems.

MA-DM-02-02 - Circuits, Paths, and Networks (Objective)

C-NR - Critical-District Reporting Not Required

Students will use Euler and Hamiltonian circuits and paths to solve problems in which a shortest route, an optimum network, or scheduling solution is needed.

MA-DM-02-03 - Applications of Discrete Graphs (Objective)

C-NR - Critical-District Reporting Not Required

Students will use trees and graphs to model and solve problems such as traveling salesperson problems, shortest route problems, electrical network problems, and minimum spanning problems.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics
Intermediate Algebra

Intermediate Algebra is intended to strengthen students' mastery of concepts and skills taught in Algebra I. These skills will be used in a variety of applications. Some additional topics from the fields of Algebra and Geometry will be studied. Students will use mathematical reasoning, communication, and technology to solve problems.

Prerequisite: Geometry or Informal Geometry, intended for students who have difficulty in Algebra I or those receiving below-average grades in Geometry, instructor recommendation

Textbook: Elementary & Intermediate Algebra (Houghton-Mifflin)

MA-IA-01 BASIC CONCEPTS OF ALGEBRA (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will apply the structure and properties of the real number system to solve algebraic problems.

MA-IA-01-01 - Rational Numbers, Exponents, Equations (Objective)

R - Reinforce

Students will apply the structure and properties of the real number system to simplify integer expressions including absolute value. Students will perform the four basic operations (add, subtract, multiply, and divide) with rational numbers, use order of operations, and evaluate exponents. They will use number relationships in problem-solving situations.

MA-IA-02 LINEAR EQUATIONS, INEQUALITIES (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations

Students will solve and apply linear equations and inequalities to real-life problem situations. Graphing calculators will be used as appropriate.

MA-IA-02-01 - Solve Linear Equations and Inequalities (Objective)

C-NR - Critical-District Reporting Not Required

Students will write, model, and evaluate linear equations and inequalities including those equations with percentages, decimals, and fractions. This will include applying the properties of opposites, inverses, and reciprocals, and combining like terms. Students should be able to solve for a specified variable in a formula. They will use linear relationships to solve problems involving practical and consumer applications and check

for reasonableness of solutions.

MA-IA-03 LINEAR EQUATIONS AND SYSTEMS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.2.2 Communicate Using Mathematical Language

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will solve linear equations by a variety of methods, and they will use linear relationships to solve problems.

MA-IA-03-01 - Solve Systems of Linear Equations (Objective)

C-NR - Critical-District Reporting Not Required

Students will represent linear equations graphically and solve systems of linear equations by a variety of methods including graphing calculators. Students will use linear relationships to solve problems involving practical applications.

MA-IA-04 RADICALS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will simplify, add, subtract, multiply, and divide radical expressions. They will apply concepts to problem solving.

MA-IA-04-01 - Radical Expressions (Objective)

C-NR - Critical-District Reporting Not Required

Students will add, subtract, multiply, divide, and simplify radical expressions. They will apply these concepts in routine problem-solving situations and communicate the reasoning used in solving problems.

MA-IA-04-02 - Solve Radical Equations (Objective)

S - Supporting

Students will solve equations involving radicals. They will use radical equations to solve applied problems.

MA-IA-05 QUADRATIC EQUATIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will solve and apply quadratic equations by a variety of methods.

MA-IA-05-01 - Solve Quadratic Equations (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve quadratic equations by completing the square, using the quadratic formula, and graphing quadratic equations. Graphing calculators will be used as appropriate. Students will use quadratic relationships to solve practical, real-life problems. They will communicate and evaluate the reasoning used.

MA-IA-06 STATISTICS AND PROBABILITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations

MA11.4.5 Connect Algebra With Other Mathematical Topics

MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range

MA11.5.2 Draw Reasonable Inferences From Statistical Data

MA11.5.3 Probability Concepts to Tell Likelihood of Events

Students will use statistics and probability to analyze, interpret, and draw valid inferences from information and data. Students will analyze a given set of data algebraically, choose an appropriate method to display data, draw inferences, and construct arguments for decision-making. They will use appropriate tools and technology to solve problems and be able to communicate their reasoning and results.

NCTM 9-12 Addenda: DATA ANALYSIS & STATISTICS BOOK:

CONNECTING MATHEMATICS, pp. 21-28.

MA-IA-06-01 - Graphing and Statistics (Objective)

C-NR - Critical-District Reporting Not Required

Students will use appropriate methods to collect, organize, interpret, and present data, including tables, graphs, and spreadsheets. They will use statistical indicators to interpret and evaluate data and make decisions as applied to real-life problem-solving situations. Students should use software as appropriate. They will communicate their reasoning and use data to make informal decisions.

MA-IA-06-02 - Technology Usage (Objective)

C-NR - Critical-District Reporting Not Required

Students will use graphing calculators/computers in data interpretation, evaluating statistical information, and drawing valid inferences to predict likely outcomes. This will include scatterplot graphs and the line of best fit.

MA-IA-06-03 - Independent and Dependent Events (Objective)

C-NR - Critical-District Reporting Not Required

Students will determine the probability of independent and dependent events.

MA-IA-06-04 - Combinations and Permutations (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve problems using fundamental methods of combination and permutations.

MA-IA-06-05 - Theoretical and Experimental Probability (Objective)

C-NR - Critical-District Reporting Not Required

Students will determine whether to use theoretical or experimental probability to represent and solve a problem involving uncertainty.

MA-IA-07 GEOMETRY AND MEASUREMENT (Content Standard)

State Standard and Benchmark Correlation:

- MA11.2.1 Use Geometry Concepts to Solve Problems
- MA11.2.2 Communicate Using Mathematical Language
- MA11.2.3 Communicate Reasoning Used in Problem Solving
- MA11.2.4 Solve Problems Involving the Coordinate Plane
- MA11.2.5 Connect Geometry With Other Mathematical Topics
- MA11.3.1 Apply Appropriate Units/Methods of Measurement
- MA11.3.2 Understand/Convert Metric/U.S. Customary Systems
- MA11.3.3 Identify/Apply Scale, Ratio, Proportion
- MA11.3.4 Solve Problems of Angle Measurement
- MA11.3.5 Solve Indirect Measurement Problems
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.4 Solve/Graph/Interpret Systems of Linear Equations
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will apply geometric and measurement concepts, properties, and relationships in a problem-solving situation. Students will demonstrate their ability to communicate the reasoning used in solving these problems.

MA-IA-07-01 - Planar Relationships (Objective)

R - Reinforce

Students will use transformations, congruency, symmetry, similarity, perpendicularity, and parallelism to solve problems.

MA-IA-07-02 - Pythagorean and Trig Relationships (Objective)

R - Reinforce

Students will apply the Pythagorean theorem and sine, cosine, and tangent ratios in a variety of problem-solving situations. Students will demonstrate the ability to integrate geometric properties with algebraic methods in order to solve problems.

MA-IA-07-03 - Measurement Applications (Objective)

R - Reinforce

Students will apply the appropriate methods and US or metric units to solve problems involving length, weight, area, volume, and angle measurement. They will demonstrate the ability to use algebraic procedures in solving problems and to communicate the reasoning used.

MA-IA-08 POLYNOMIALS AND RATIONAL EXPRESSIONS (Content Standard)

State Standard and Benchmark Correlation:

- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts

Students will demonstrate an understanding of and be able to perform operations with polynomial expressions.

MA-IA-08-01 - Factoring Polynomials (Objective)

T - Teach

Students will factor expressions including trinomials, differences of squares, and perfect square trinomials.

MA-IA-08-02 - Polynomial Expressions (Objective)

T - Teach

Students will add, subtract, multiply, divide, and simplify polynomial expressions.

MA-IA-08-03 Rational Expressions (Objective)

S - Supporting

Students will simplify and perform basic operations with rational expressions. They will solve equations involving rational expressions to solve real-life problems.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics
Problem Solving

Students will learn a broad set of problem-solving strategies and apply them in solving problems. Students will learn to connect mathematical content, reasoning, thinking, and communication skills to find solutions to a wide variety of problems.

Prerequisite: Informal Geometry or Geometry, instructor recommendation

Textbook: Problem Solving Strategies: Crossing the River With Dogs (Key Curriculum Press)

MA-PS-01 - STRATEGIES FOR PROBLEM SOLVING (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use a variety of strategies to solve problems both cooperatively and individually. Strategies may include logical reasoning, using a pattern, using diagrams or objects, making an organized list or table, working backwards, and making a simpler problem.

MA-PS-01-01 - Logical Reasoning (Objective)

C-NR - Critical-District Reporting Not Required

Students will use strategies which emphasize logical reasoning. Examples are the transitive property for inequalities, and deductive and inductive reasoning.

MA-PS-01-02 - Use a Pattern (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve problems which show a definite pattern. Examples are 5×2 , 5×3 , 5×4 , and powers of 2.

MA-PS-01-03 - Use Diagrams, Pictures, Objects (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve problems by using a diagram or a picture, or by using objects to make a physical representation of the problem.

MA-PS-01-04 - Make an Organized List or Table (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve problems by making an organized list or table. An example is to determine how many ways there are to arrange four items.

MA-PS-01-05 - Work Backwards (Objective)

C-NR - Critical-District Reporting Not Required

Students will use the problem-solving strategy of working backwards to solve problems such as how many items are there of each type when the total is known.

MA-PS-01-06 - Make a Simpler Problem (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve difficult problems by creating a simpler problem that relates to the original larger problem. An example is how many oranges would there be in a pyramid of 15 rows. Students would examine a pyramid of 15 rows (total 5), three rows (total 13), etc.

MA-PS-01-07 - Guess and Check (Objective)

C-NR - Critical-District Reporting Not Required

Students will use the guess-and-check method to solve problems.

MA-PS-02 APPLICATIONS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will apply problem-solving strategies learned so far to problems in the areas of algebra, geometry, logic matrixes, measurement, the use of Venn diagrams, and non-routine problems.

MA-PS-02-01 - Content Area Problems: Algebra, Geometry (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve problems frequently encountered in the areas of algebra, geometry, and measurement.

MA-PS-02-02 - Logic Structures: Matrix, Venn Diagrams (Objective)

C-NR - Critical-District Reporting Not Required

Students will use logic structures like logic matrixes and Venn diagrams to solve problems. A typical problem is a scheduling problem.

MA-PS-02-03 - Non-Routine Problems: Cooperative Problem Solving (Objective)

C-NR - Critical-District Reporting Not Required

Students will solve a variety of problems by working in cooperative groups and brainstorming possible solutions. Any of the problem-solving techniques learned this semester may be applied to solve these problems.

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Campbell County School District # 1
Gillette, Wyoming

Mathematics
Accelerated Pre -Calculus

Accelerated Pre-Calculus will continue the CPM curriculum from Accelerated Algebra II. This class will prepare the student for Calculus or AP Calculus and will concentrate on polynomial and trigonometric functions, natural logarithms, limits, and introductory derivatives and related rates.

Prerequisite: B- or higher grade in Accelerated Algebra II or equivalent; recommended for students intending to take AP Calculus; instructor recommendation required.

Textbook: CPM Math, 1st Edition (Math Analysis)

Advanced Designation Course - Mathematics

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Mathematics content area.

Students at the advanced level in Mathematics utilize or synthesize information to make complex mathematical connections. They apply concepts, skills, strategies, and tools/technology to efficiently solve problems. Students provide valid and convincing evidence that justifies the procedures, solutions, and inferences. They communicate reasoning and solutions using coherent and clear mathematical language.

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

MA-PX-01 MODELING DATA AND STATISTICAL ANALYSIS (Content Standard)

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.3 Graph Linear Equations, Interpret the Results
- MA11.4.5 Connect Algebra With Other Mathematical Topics
- MA11.5.2 Draw Reasonable Inferences From Statistical Data
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will model data including linear models using Median-Median lines to create a line of best fit. Students will investigate how the statistical functions on the calculator can help model data and assist in finding regression lines as well as correlation coefficients.

MA-PX-01-01 - Linear Models (Objective)

C-NR - Critical-District Reporting Not Required

Students will model data including linear models using Median-Median lines to create a line of best fit.

MA-PX-01-02 - Statistics (Objective)

C-NR - Critical-District Reporting Not Required

Students will investigate how the statistical functions on the calculator can help model

data and assist in finding regression lines as well as correlation coefficients.

MA-PX-02 PIECEWISE FUNCTIONS AND AREA UNDER CURVES (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.2.3 Communicate Reasoning Used in Problem Solving

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.1 Apply Appropriate Units/Methods of Measurement

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will be introduced to piecewise functions and apply them to real-life situations.

Students will be introduced to integration by finding the area under a curve.

MA-PX-02-01 - Piecewise Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will be introduced to piecewise functions and apply them to real-life situations.

MA-PX-02-02 - Area Under Curves (Objective)

C-NR - Critical-District Reporting Not Required

Students will investigate summations, and then integration, by finding the area under a curve.

MA-PX-03 LOGARITHMS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

Students will learn the laws and properties of logarithms and apply them to real-life situations.

MA-PX-03-01 - Properties and Laws of Logarithms (Objective)

C-NR - Critical-District Reporting Not Required

Students will learn the laws and properties of logarithms and apply them to real-life situations.

MA-PX-04 TRIGONOMETRY (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.1.4 Use Proportional Reasoning to Solve Problems

MA11.2.2 Communicate Using Mathematical Language

MA11.2.5 Connect Geometry With Other Mathematical Topics

MA11.3.3 Identify/Apply Scale, Ratio, Proportion

MA11.3.4 Solve Problems of Angle Measurement

MA11.3.5 Solve Indirect Measurement Problems

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will use the unit circle to extend the definition of the six trigonometric functions to all angles and will increase their understanding of degree and radian measure. The students will simplify trigonometric expressions, solve trigonometric equations, and graph trigonometric and inverse trigonometric functions. Vectors will also be investigated, and the Law of Sines and Cosines will be reviewed.

MA-PX-04-01 - Trigonometric Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will use the unit circle to extend the definition of the six trigonometric functions to all angles and will increase their understanding of degree and radian measure.

Students will find a mathematical model for sinusoidal functions.

MA-PX-04-02 - Trigonometric Expressions and Equations (Objective)

C-NR - Critical-District Reporting Not Required

Students will simplify trigonometric expressions by using identities and formulas, and they will also solve trigonometric equations with a domain from negative infinity to infinity.

MA-PX-04-03 - Inverse Trigonometric Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will define the inverse trigonometric functions and sketch their graphs.

MA-PX-04-04 - Vectors, Law of Sines, Law of Cosines (Objective)

C-NR - Critical-District Reporting Not Required

Students will use the Law of Sines and Cosines to solve triangles and to find their area.

Students will apply vectors to navigation problems and will apply the dot product, an operation using vectors.

MA-PX-05 ALGEBRA CONCEPTS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.4.1 Use Algebraic Concepts, Symbols, Skills

MA11.4.2 Write/Model/Evaluate Algebra Concepts

MA11.4.3 Graph Linear Equations, Interpret the Results

MA11.5.3 Probability Concepts to Tell Likelihood of Events

Students will investigate many algebraic concepts that will help them be successful in college math courses.

MA-PX-05-01 - Algebra Concepts (Objective)

C-NR - Critical-District Reporting Not Required

Students will investigate several algebraic concepts that will help them be successful in college math courses. These concepts include substitution, exponents, Pascal's Triangle, binomial probabilities, rational expressions, increasing and decreasing functions, concave up and concave down functions, even and odd functions, polynomial division, and finding inverses.

MA-PX-06 LIMITS (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

- MA11.2,1 Use Geometry Concepts to Solve Problems
- MA11.4,1 Use Algebraic Concepts, Symbols, Skills
- MA11.4,2 Write/Model/Evaluate Algebra Concepts
- MA11.4,5 Connect Algebra With Other Mathematical Topics

Students will find the limits of various functions at infinity, work with the natural exponential functions (e^x), explore limits of rational functions, and find sums of geometric series.

MA-PX-06-01 - Limits (Objective)

C-NR - Critical-District Reporting Not Required

Students will find the limits of various functions at infinity, work with the natural exponential functions (e^x), explore limits of rational functions, and find sums of geometric series.

MA-PX-07 DERIVATIVES (Content Standard)

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.4.5 Connect Algebra With Other Mathematical Topics

Students will find the average rates of change of many types of functions and then take limits of these to find an instantaneous rate of change. This will lead to defining the derivative and applying the definition to find the instantaneous rate of change of a function. Students will also relate distance and velocity graphs and functions to one another.

MA-PX-07-01 - Derivatives (Objective)

C-NR - Critical-District Reporting Not Required

Students will find the average rates of change of many types of functions and then take limits of these to find an instantaneous rate of change, leading to the definition of the derivative.

Campbell County School District # 1
Gillette, Wyoming

MATHEMATICS
STATISTICS & PROBABILITY

Students will learn to use basic statistical procedures, data analysis strategies, and fundamental properties of probability. Students will use these concepts to analyze situations and experiments for decision making and predicting outcomes. Students will use technology to organize information and analyze problems using tables, graphs, and charts.

Prerequisite: Intermediate Algebra or Algebra II; instructor recommendation.

Textbook: Statistics (Prentice Hall)

MA-SP-01 DATA ANALYSIS AND STATISTICS (Content Standard)

State Standard and Benchmark Correlation:

- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.5.1 Apply Knowledge of Mean, Median, Mode, Range
- MA11.5.2 Draw Reasonable Inferences From Statistical Data
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use basic statistical measures and apply them in the analysis of sets of data.

MA-SP-01-01 - Basic Statistics (Objective)

C-NR - Critical-District Reporting Not Required

Students will collect, organize, display, and calculate measures of central tendencies on sets of data. Numerical information will be represented using tables, charts, graphs, and spreadsheets by using appropriate computer software.

MA-SP-01-02 - Data Analysis (Objective)

C-NR - Critical-District Reporting Not Required

Students will use statistical methods and indicators to make predictions about future events. Applications may include business, sports, and personal activities.

MA-SP-02 COMBINATORICS (Content Standard)

State Standard and Benchmark Correlation:

- MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms
- MA11.1.3 Explain Choice of Strategies, Justify Solutions
- MA11.4.1 Use Algebraic Concepts, Symbols, Skills
- MA11.4.2 Write/Model/Evaluate Algebra Concepts
- MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will use the vocabulary of combinatorics and will investigate a variety of techniques in counting.

MA-SP-02-01 - Combinatorics to Solve Problems (Objective)

C-NR - Critical-District Reporting Not Required

Students will use Venn diagrams, tree diagrams, the fundamental principles of counting, and formulas for permutations and combinations to solve problems. The graphing calculator will be used to assist the students with these techniques.

MA-SP-03 PROBABILITY (Content Standard)

State Standard and Benchmark Correlation:

MA11.1.1 Represent/Apply Real Numbers in a Variety of Forms

MA11.1.2 Apply Structure/Properties of Real Number System

MA11.1.3 Explain Choice of Strategies, Justify Solutions

MA11.5.3 Probability Concepts to Tell Likelihood of Events

MA11.5.4 Determine/Collect/Organize/Analyze Relevant Data

Students will devise and carry out simple probability experiments. They will use the vocabulary and formulas for determining probability. Use of technology will be emphasized.

MA-SP-03-01 - Theoretical Probability (Objective)

C-NR - Critical-District Reporting Not Required

Students will use investigation and experimental probability to develop an understanding of theoretical probability.

MA-SP-03-02 - Determining Probabilities (Objective)

C-NR - Critical-District Reporting Not Required

Students will investigate and determine the probabilities of independent and dependent events, mutually exclusive and inclusive events, and conditional probabilities. Students will use probabilities to determine odds.

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