

## MTH 153 Algebra 1-B

Adopted Textbook: If applicable	<b>Course Overview: The main goal of Algebra is to develop fluency in working with linear equations. Students will extend their experiences with tables, graphs, and equations and solve linear equations and inequalities and systems of linear equations and inequalities. Students will extend their knowledge of the number system to include irrational numbers. Students will generate equivalent expressions and use formulas. Students will simplify polynomials and begin to study quadratic relationships. Students will analyze situations verbally, numerically, graphically, and symbolically. Students will apply mathematical skills and make meaningful connections to life experiences.</b>
Length: Full Year	
Grades:	

Chapter 7 Exponents and Exponential Functions						
<b>STANDARDS</b>  <b>A.SSE.2</b> <b>F.IF.8b</b> <b>N.RN.1</b> <b>N.RN.2</b> <b>F.IF.7e</b> <b>F.LE.2</b> <b>F.BF.2</b> <b>F.LE.1</b> <b>F.IF.3</b>	<b>SUGGESTED ESSENTIAL QUESTIONS</b>  <b>How can you make good decisions?</b>  <b>What factors can affect good decision making?</b>	<b>UNIT CONTENT</b> <b>Core Concepts:</b> -simplify polynomial expressions and apply the laws of exponents in problem-solving situations -graph and analyze exponential functions -analyze data and represent situations involving exponential growth and decay using tables, graphs, or algebraic methods -relate geometric sequences to exponential functions, and write recursive formulas to represent sequences <b>Academic Vocabulary/ Terminology:</b> monomial (Lesson 7-1) constant (Lesson 7-1) zero exponent (Lesson 7-2) negative exponent (Lesson 7-2)	<b>UNIT OUTCOMES</b> -use the necessary algebraic skills required to simplify algebraic expressions and inequalities in problem-solving situations -use properties of exponents to simplify expressions and to transform and solve exponential and logarithmic equations	<b>SUGGESTED ACTIVITIES</b> -exponential functions practice -investment calculations -credit card debt calculations	<b>SUGGESTED SUMMATIVE ASSESSMENT</b>  Chapter Test	<b>ALASKA CULTURAL STANDARDS AND CONNECTIONS</b>

		order of magnitude (Lesson 7-2) rational exponent (Lesson 7-3) cube root (Lesson 7-3) $n$ th root (Lesson 7-3) exponential equation (Lesson 7-3) scientific notation (Lesson 7-4) exponential function (Lesson 7-5) exponential growth (Lesson 7-5) exponential decay (Lesson 7-5) compound interest (Lesson 7-6) geometric sequence (Lesson 7-7) common ratio (Lesson 7-7) recursive formula (Lesson 7-8)				
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### Chapter 8 Quadratic Expressions and Equations

STANDARD S	SUGGESTED ESSENTIAL QUESTIONS When could a nonlinear function be used to model a real-world situation?	UNIT CONTENT <b>Core Concepts:</b> -add, subtract, and multiply polynomials -factor as necessary in problem situations -solve quadratic equations using concrete models, tables, graphs, and algebraic methods  <b>Academic Vocabulary/ Terminology:</b> polynomial (Lesson 8-1) binomial (Lesson 8-1) trinomial (Lesson 8-1) degree of a monomial (Lesson 8-1) degree of a polynomial (Lesson	UNIT OUTCOMES -use tools including factoring to simplify expressions and to transform and solve equations -determine reasonable domain and range values of quadratic functions -analyze situations involving quadratic functions and formulate quadratic equations to solve problems -solve quadratic equations using	SUGGESTED ACTIVITIES -FOIL video -task cards for adding and subtracting polynomials -multiplying polynomials practice	SUGGESTED SUMMATIVE ASSESSMENT  Chapter Test	ALASKA CULTURAL STANDARDS AND CONNECTIONS
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		8-1) standard form of a polynomial (Lesson 8-1) leading coefficient (Lesson 8-1) FOIL method (Lesson 8-3) quadratic expression (Lesson 8-3) factoring (Lesson 8-5) factoring by grouping (Lesson 8-5) Zero Product Property (Lesson 8-5) quadratic equation (Lesson 8-6) prime polynomial (Lesson 8-7) difference of two squares (Lesson 8-8) perfect square trinomial (Lesson 8-9) Square Root Property (Lesson 8-9)	graphs, tables, and algebraic methods			
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### Chapter 9 Quadratic Functions and Equations

Chapter 9 Quadratic Functions and Equations						
<b>STANDARDS</b> <b>F.IF.4</b> <b>F.IF.7a</b> <b>A.REI.4b</b> <b>A.SSE.3b</b> <b>F.IF.8a</b> <b>F.IF.6</b> <b>F.LE.1</b> <b>F.IF.7b</b>	<b>SUGGESTED ESSENTIAL QUESTIONS</b> <b>Why do we use different methods to solve math problems?</b>	<b>UNIT CONTENT</b> <b>Core Concepts:</b> -identify and sketch the general forms of quadratic parent functions -analyze graphs of quadratic functions and draw conclusions -make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the	<b>UNIT OUTCOMES</b> -relate representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions -determine a quadratic function from its roots or a graph -determine solutions of exponential equations using graphs, tables,	<b>SUGGESTED ACTIVITIES</b> -sketching quadratic equations practice -solving equations using graphs activity -transformations of quadratic functions (Desmos)	<b>SUGGESTED SUMMATIVE ASSESSMENT</b> Chapter Test	<b>ALASKA CULTURAL STANDARDS AND CONNECTIONS</b>

		<p>horizontal intercepts of the graph of the function</p> <ul style="list-style-type: none"> <li>-solve quadratic equations using concrete models, tables, graphs, and algebraic methods</li> <li>-use characteristics of the quadratic parent function to sketch the related graphs</li> <li>-analyze functions with successive differences and ratios</li> <li>-identify and graph special functions.</li> </ul> <p><b>Academic Vocabulary/ Terminology:</b></p> <p>quadratic function (Lesson 9-1)</p> <p>parabola (Lesson 9-1)</p> <p>axis of symmetry (Lesson 9-1)</p> <p>vertex (Lesson 9-1)</p> <p>minimum (Lesson 9-1)</p> <p>maximum (Lesson 9-1)</p> <p>double root(Lesson 9-2)</p> <p>transformation (Lesson 9-3)</p> <p>completing the square (Lesson 9-4)</p> <p>Quadratic Formula (Lesson 9-5)</p> <p>discriminant (Lesson 9-5)</p> <p>step function (Lesson 9-7)</p> <p>greater integer function (Lesson 9-7)</p> <p>absolute value function (Lesson 9-7)</p>	and algebraic methods			
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### Chapter 10 Radical Functions and Geometry

STANDARDS F.IF.4 F.IF.7b A.REI.4a N.RN.2 A.CED.2	SUGGESTED ESSENTIAL QUESTIONS How can you choose a model to represent a real-world situation?	UNIT CONTENT Core Concepts: -add, subtract, multiply, and simplify radical expressions -solve radical equations -use the Pythagorean Theorem and trigonometric ratios to solve problems Academic Vocabulary/ Terminology: radicand (Lesson 10-1) radical function (Lesson 10-1) conjugate (Lesson 10-2) radical equations (Lesson 10-4) hypotenuse (Lesson 10-5) legs (Lesson 10-5) converse (Lesson 10-5) midpoint (Lesson 10-5) sine (Lesson 10-6) cosine (Lesson 10-6) tangent (Lesson 10-6) trigonometry (Lesson 10-6) inverse cosine (Lesson 10-6) inverse sine (Lesson 10-6) inverse tangent (Lesson 10-6)	UNIT OUTCOMES Preparation for Geometry -use the Pythagorean Theorem -identify and apply patterns from right triangles to solve meaningful problems -use formulas for length, slope, and midpoint -use ratios to solve problems involving similar figures Preparation for Algebra 2 -formulate equations and inequalities based on square root functions, use a variety of methods to solve them, and analyze the solutions in terms of the situation	SUGGESTED ACTIVITIES -finding missing side lengths of real world applications -creating triangles with specific angles (ramps) -formulas with radicals	SUGGESTED SUMMATIVE ASSESSMENT  Chapter 10 Test	ALASKA CULTURAL STANDARDS AND CONNECTIONS
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### Chapter 12 Statistics and Probability

STANDARD S S.ID.2 S.ID.3	SUGGESTED ESSENTIAL QUESTIONS How are statistics and	UNIT CONTENT Core Concepts: -identify various sampling techniques and recognize a biased sample	UNIT OUTCOMES -identify various sampling techniques and recognize a biased sample -count outcomes using the Fundamental	SUGGESTED ACTIVITIES -Google Sheets data displays -calculating mean,	SUGGESTED SUMMATIVE ASSESSMENT Chapter 12 Test	ALASKA CULTURAL STANDARDS AND CONNECTIONS
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	probability used in the real world?	-count outcomes using the Fundamental Counting Principle -use combinations and permutations to determine probabilities -find the probability of two independent events or dependent events, and find the probability of two mutually exclusive or inclusive events -use random variables to compute probability, and use probability distributions to solve real-world problems -use probability simulations to model real-world situations <b>Academic Vocabulary/ Terminology:</b> population (Lesson 12-1) sample (Lesson 12-1) bias (Lesson 12-1) observational study (Lesson 12-1) experiment (Lesson 12-1) statistic (Lesson 12-2) parameter (Lesson 12-2) standard deviation (Lesson 12-2) distribution (Lesson 12-3) symmetric distribution (Lesson 12-3) theoretical probability (Lesson 12-5) experimental probability (Lesson 12-5)	Counting Principle -use combinations and permutations to determine probabilities -find the probability of two independent events or dependent events, and find the probability of two mutually exclusive or inclusive events -use random variables to compute probability, and use probability distributions to solve real-world problems -use probability simulations to model real-world situations	median, mode, etc. in Google Sheets -Farkle probability activity		
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		simulation (Lesson 12-5) permutation (Lesson 12-6) combination (Lesson 12-6) compound event (Lesson 12-7) independent events (Lesson 12-7) dependent events (Lesson 12-7) mutually exclusive (Lesson 12-7) random variable (Lesson 12-8) probability distribution (Lesson 12-8) expected value (Lesson 12-8)				
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