

# Algebra I Scope and Sequence

Pacing Guide, MGH, Student Expectations

\*Pre-AP only topics highlighted\*

Unit Time	1 <sup>st</sup> Grading Period (8 weeks - 40 days)	Student Expectations {See Curriculum pages for Specificity}	EM
2 days	<b>Review basic operations</b> <ul style="list-style-type: none"> <li>Real Numbers {Subsets, simplifying radicals} (0-2)</li> <li>Operations with Integers (0-3)</li> </ul>	<b>Review basic operations</b> <p>8.2(B) approximate the value of an irrational number, including <math>\pi</math> &amp; square roots of numbers less than 225, &amp; locate that rational number approximation on a number line.</p> <p>7.2(A) extend previous knowledge of sets &amp; subsets using a visual representation to describe relationships between sets of rational numbers</p> <p>6.3(D) add, subtract, multiply, &amp; divide integers fluently</p>	/
10 days	<b>Exponents &amp; Radicals</b> <ul style="list-style-type: none"> <li>Exponent Laws (7-1, 7-2) <b>A.11B</b> (3 days)</li> <li>Simplify radicals (10-2) (2 days) A.11A</li> <li>Rational Exponents (7-3) A.11A, <b>A.11B</b> (2 days)</li> <li>Scientific Notation (7-4) A.9B</li> </ul>	<b>Exponents &amp; Radicals</b> <p>A.11(A) simplify numerical radical expressions involving square roots</p> <p><b><u>A.11(B) simplify numeric &amp; algebraic expressions using the laws of exponents, including integral &amp; rational exponents</u></b></p>	p.233 p.237;239
21 days	<b>Linear Equations</b> <ul style="list-style-type: none"> <li>Properties of Numbers (1-3)</li> <li>Order of Operations &amp; Distributive Property (1-2, 1-4)</li> <li>Writing Equations (2-1)</li> <li>Solving One-step &amp; Multi-step Equations (2-2, 2-3)</li> <li>Solving Equations Variables On Both Sides (2-4) <b>A.5A</b> (3 days)</li> <li>Solve Equations with Absolute Value (2-5) – Pre AP only*Vertical Alignment to Algebra 2</li> <li>Literal Equations (2-8) A.12E (2 days)</li> </ul> <p>-----</p> <b>Simple Inequalities</b> <ul style="list-style-type: none"> <li>Solving Inequalities – Add/Sub (5-1) A.5B</li> <li>Solving Inequalities – Mult/Div (5-2) A.5B</li> <li>Solving Multi Step Inequalities (5-3) A.5B (2 days)</li> <li>Solving Compound Inequalities (5-4) (1-2 days)</li> </ul>	<b>Linear Equations</b> <p><b><u>A.5(A) solve linear equations in one variable, including those for which the application of the distributive property is necessary &amp; for which variables are included on both sides</u></b></p> <p>A.12(E) solve mathematic &amp; scientific formulas, &amp; other literal equations, for a specified variable</p> <p>-----</p> <b>Simple Inequalities</b> <p>A.5(B) solve linear inequalities in one variable, including those for which the application of the distributive property is necessary &amp; for which variables are included on both sides</p>	p.106,108,112 p.258,260 p.114
6 days	<b>Linear Functions</b> <ul style="list-style-type: none"> <li>Relations and Functions (1-6, 1-7) A.12A, A.12B</li> <li>Graphs of Functions (1-8) <b>A.3C, A.2A</b> (2 days)</li> <li>Graphing Linear Equations (3-1) <b>A.3C</b> (2 days)</li> </ul>	<b>Linear Functions</b> <p>A.12(A) decide whether relations represented verbally, tabularly, graphically, &amp; symbolically define a function</p> <p>A.12(B) evaluate functions, expressed in function notation, given one or more elements in their domains</p> <p><b><u>A.3(C) graph linear functions on the coordinate plane &amp; identify key features, including x-intercept, y-intercept, zeros, &amp; slope, in mathematical &amp; real-world problems</u></b></p> <p><b><u>A.2(A) determine the domain &amp; range of a linear function in mathematical problems; determine reasonable domain &amp; range values for real-world situations, both continuous &amp; discrete; &amp; represent domain &amp; range using inequalities</u></b></p>	p.240; 242; 244; 246 p.63;65;67 p.3;5;9 p.245
1 day	<b>1<sup>st</sup> grading period CBA</b>		



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Unit Time	2 <sup>nd</sup> Grading Period (8 weeks-42.5 days)	Student Expectations {See Curriculum pages for Specificity}	EM
8 days	<b>Linear Functions continued...</b> <ul style="list-style-type: none"> <li>• Zeros of Linear Functions (3-2) <b>A.3C</b> (2 days)</li> <li>• Meaning of slope (3-3) <b>A3.B</b> (2 days)</li> <li>• Direct variation (3-4) A.2D (1 day)</li> <li>• Arithmetic Sequences(3-5) A.12D (1 day)</li> </ul>	<b>Linear Functions continued...</b> <b><u>A.3(B) calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical &amp; real-world problems</u></b> A.2(D) write and solve equations involving direct variation A.12(D) write a formula for the nth term of arithmetic & geometric sequences, given the value of several of their terms	p.52;54;58  p.24;26
18 days	<b>Equations of Linear Functions</b> <ul style="list-style-type: none"> <li>• Graphing in Slope Intercept form (4-1) A.3A, <b>A.3C</b> (8th grade review) (2 days)</li> <li>• Graphing Inequalities (5-6 LAB) A.2H, <b>A.3D</b> (2 days)</li> <li>• Family of Linear graphs (4-1 LAB) A.3E, <b>A.3C</b></li> <li>• Writing Equations In Slope Intercept Form (4-2) A.2B, <b>A.2C</b> (building on 8th grade review- 8.5A &amp; 8.5B) (2 days)</li> <li>• Writing Equations In Point-Slope Form (4-3) A.2B, <b>A.2C</b>, A.3A (2 days)</li> </ul> <p style="text-align: center;">-----</p> <ul style="list-style-type: none"> <li>• Parallel And Perpendicular Lines (4-4) A.2E, A.2F, A.2G (2 days)</li> <li>• Scatterplots and Lines of Fit (4-5) A.4C</li> <li>• Association and Causation (4-5 LAB) A.4B</li> <li>• Linear Regression (4-6) A.4A, A.4C (2 days)</li> </ul>	<b>Equations of Linear Functions</b> A.3(A) determine the slope of a line given a table of values, a graph, two points on the line, & an equation written in various forms, including $y = mx + b$ , $Ax + By = C$ , & $y - y_1 = m(x - x_1)$ <b>A.3(D) graph the solution set of linear inequalities in two variables on the coordinate plane</b> A.2(H) write linear inequalities in two variables given a table of values, a graph, & a verbal description <b><u>A.3(C) graph linear functions on the coordinate plane &amp; identify key features, including x-intercept, y-intercept, zeros, &amp; slope, in mathematical &amp; real-world problems</u></b> A.3(E) determine the effects on the graph of the parent function $f(x) = x$ when $f(x)$ is replaced by $af(x)$ , $f(x) + d$ , $f(x - c)$ , $f(bx)$ for specific values of $a$ , $b$ , $c$ , and $d$ <b><u>A.2(C) write linear equations in two variables given a table of values, a graph and a verbal description.</u></b> A.2(B) write linear equations in two variables in various forms, including $y = mx + b$ , $Ax + By = C$ , & $y - y_1 = m(x - x_1)$ , given one point & the slope & given two points <p style="text-align: center;">-----</p> A.2(E) write the equation of a line that contains a given point & is parallel to a given line A.2(F) write the equation of a line that contains a given point & is perpendicular to a given line A.2(G) write an equation of a line that is parallel or perpendicular to the x- or y-axis & determine whether the slope of the line is zero or undefined  A.4(B) compare & contrast association & causation in real-world problems A.4(C) write, with & without technology, linear functions that provide a reasonable fit to data to estimate solutions & make predictions for real-world problems A.4(A) calculate, using technology, the correlation coefficient between two quantitative variables & interpret this quantity as a measure of the strength of the linear association	p.46; 48  p.68;72  p.62;64;66  p.76,80  p.36;38  p.28;30  p.32  p.100  p.102;104  p.94;98
10 days	<b>Systems of Linear Equations &amp; Inequalities</b> <ul style="list-style-type: none"> <li>• Graphing Systems Of Linear Equations (6-1) A. 3F, A.3G (2 days)</li> <li>• Substitution (6-2) A.2I, <b>A.5C</b> (3 days)</li> <li>• Elimination (6-3,6-4) A.2I, <b>A.5C</b> (3 days)</li> </ul>	<b>Systems of Linear Equations &amp; Inequalities</b> <b><u>A.5(C) solve systems of two linear equations with two variables for mathematical &amp; real-world problems</u></b> A.3(F) graph systems of two linear equations in two variables on the coordinate plane & determine the solutions if they exist A.3(G) estimate graphically the solutions to systems of two linear equations with two variables in real-world problems <b><u>A.2(I) write systems of two linear equations given a table of values, a graph, &amp; a verbal description</u></b>	p.  p.82;84;86  p.40;42;44
6 days	<b>PSAT Semester Review &amp; Exam</b>	<b>Semester Review &amp; Exam</b>	



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Unit Time	3 <sup>rd</sup> Grading Period ( 9 weeks – 42 days)	Student Expectations {See Curriculum pages for Specificity}	EM
7 days	<b>Systems of Linear Equations &amp; Inequalities</b> <ul style="list-style-type: none"> <li>Review Methods Of Solving Linear Systems (1 day)</li> <li>Applying Systems of Linear Equations (6-5) <b>A.2I</b>, <b>A.5C</b> (2 days)</li> <li>Systems of Inequalities (6-6) A.3H (1 day)</li> </ul>	<b>Systems of Linear Equations &amp; Inequalities</b> <b>A.2I</b> , <b>A.5C</b> see above A.3(H) graph the solution set of systems of two linear inequalities in two variables on the coordinate plane	p.40;42;44  p.88;90
14 days	<b>Exponential Functions</b> <ul style="list-style-type: none"> <li>Exponent Rules Review (7.3) <b>A.11B</b> (2 days)</li> <li>Exponential Functions (7-5) A.9A, <b>A.9D</b>, A9C (2 days)</li> <li>Growth And Decay (7-6) A.9B, <b>A.9C</b> (3 days)</li> <li>Fitting Exponential Functions (7-6 LAB) A.9E (1 day)</li> <li>Geometric Sequences (7-7) <b>A.9C</b>, A.12D (2 days)</li> <li>Recursive Formulas (7-8) A.12C, A.12D (1 day)</li> </ul>	<b>Exponential Functions</b> Review <b>A.11B</b> , A.11A <b>A.9(C) write exponential functions in the form <math>f(x) = ab^x</math> (where b is a rational number) to describe problems arising from mathematical &amp; real-world situations, including growth &amp; decay</b> <b>A.9(D) graph exponential functions that model growth &amp; decay &amp; identify key features, including y-intercept &amp; asymptote, in mathematical &amp; real-world problems</b> A.9(A) determine the domain & range of exponential functions of the form $f(x) = ab^x$ & represent the domain & range using inequalities A.9(B) interpret the meaning of the values of a & b in exponential functions of the form $f(x) = ab^x$ in real-world problems A.9(E) write, using technology, exponential functions that provide a reasonable fit to data & make predictions for real-world problems A.12(C) identify terms of arithmetic & geometric sequences when the sequences are given in function form using recursive processes A.12(D) write a formula for the nth term of arithmetic & geometric sequences, given the value of several of their terms	p.232 p.236;238  p.176;178  p.182;186  p.172; 174  p.188,190  p.250;252  p.254,256
21 days	<b>Quadratic Expressions and Equations</b> {Modeling With Algebra Tiles} <ul style="list-style-type: none"> <li>Adding and subtracting polynomials (LAB &amp; 8-1) A.10A (2 days)</li> <li>Multiplying Polynomial by Binomial (8-2) {Modeling With Algebra Tiles}</li> <li>Multiplying Polynomials (8-3 &amp; LAB) A.10B, A.10D (2 days)</li> <li>Special Products (8-4) A.10B, <b>A.10E</b> (2 days)</li> <li>Using Distributive Property-GCF (8-5) <b>A.8A</b> (2 days)</li> </ul> ----- {Modeling With Algebra Tiles} <ul style="list-style-type: none"> <li>Factoring Trinomials (8-5 LAB) <b>A.8A</b> (3 days)</li> <li>Solving Quadratics <math>a=1</math> {Sum &amp; Product pattern} (8-6) <b>A.8A</b>, <b>A.10E</b> (2 days)</li> <li>Solving Quadratics <math> a  &gt; 1</math> (8-7) <b>A.8A</b>, <b>A.10E</b> (2 days) {Split the Middle}</li> <li>Difference of Squares (8-8) A.10F (2 days)</li> <li>Perfect squares (8-9) (2 days) <b>A.10E</b></li> </ul>	<b>Quadratic Expressions &amp; Equations</b> A.10(A) add & subtract polynomials of degree one & degree two  A.10(B) multiply polynomials of degree one & degree two  A.10(D) rewrite polynomial expressions of degree one & degree two in equivalent forms using the distributive property  <b><u>A.8(A) solve quadratic equations having real solutions by factoring, taking square roots, completing the square, &amp; applying the quadratic formula</u></b> {specificity includes modeling}  <b>A.10(E) factor, if possible, trinomials with real factors in the form <math>ax^2 + bx + c</math>, including perfect square trinomials of degree two</b>  A.10(F) decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial	p.192; 194  p.196; 200; 202  p.212  p.261; 218; 220; 224; 226  p.230



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Unit Time	4 <sup>th</sup> Grading Period ( 10 weeks – 48 days) 37 days before Alg. 1 EOC testing	Student Expectations {See Curriculum pages for Specificity}	EM		
30 days {2 days for English I STAAR}	<b>Polynomials (Quadratic Functions and Equations)</b> <ul style="list-style-type: none"> <li>• Graphing Quadratic Functions (9-1) <b>A.6A, A.7A</b> (3 days)</li> <li>• Solving Quadratic Equations By Graphing (9-2) A.6C, A.7B, <b>A.7A</b> (1 day)</li> <li>• Transformations (Vertex Form) (9-3) A.6B, <b>A.7C, A.7A</b> (3 days)</li> <li>• Analyzing Functions (vert align Alg2) (9-6) (2 days)</li> <li>• Curve Fitting: Quad Regression (9-6 LAB) A.8B</li> <li>-----</li> <li>• Solving by Completing the square (9-4) <b>A8.A</b> (2 days)</li> <li>• Solving by Quadratic Formula (9-5) <b>A.8A</b> (2 days)</li> <li>-----</li> <li>• Simplifying Rational Expressions (11-3)</li> <li>• Dividing Rational Expressions – canceling factors (11-4) A.10C</li> <li>• Dividing Polynomials (11-5) A.10C (2 days)</li> </ul> <b>ELA I EOC</b>	<b>Polynomials (Quadratic Functions and Equations)</b>  <b>A.6(A) determine the domain &amp; range of quadratic functions &amp; represent the domain &amp; range using inequalities</b>  <b><u>A.7(A) graph quadratic functions on the coordinate plane &amp; use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, &amp; the equation of the axis of symmetry</u></b>  A.6(C) write quadratic functions when given real solutions & graphs of their related equations  A.7(B) describe the relationship between the linear factors of quadratic expressions & the zeros of their associated quadratic functions  A.6(B) write equations of quadratic functions given the vertex & another point on the graph, write the equation in vertex form ( $f(x) = a(x - h)^2 + k$ ), & rewrite the equation from vertex form to standard form ( $f(x) = ax^2 + bx + c$ )  A.8(B) write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions & make predictions for real-world problems  <b>A.7(C) determine the effects on the graph of the parent function <math>f(x) = x^2</math> when <math>f(x)</math> is replaced by <math>af(x)</math>, <math>f(x) + d</math>, <math>f(x - c)</math>, <math>f(bx)</math> for specific values of <math>a</math>, <math>b</math>, <math>c</math>, &amp; <math>d</math></b>  <b><u>A.8(A) solve quadratic equations having real solutions by factoring, taking square roots, completing the square, &amp; applying the quadratic formula</u></b> (highlighted – not yet been tested)  A.10(C) determine the quotient of a polynomial of degree one & polynomial of degree two when divided by a polynomial of degree one & polynomial of degree two when the degree of the divisor does not exceed the degree of the dividend	p.125; 127  p.140; 142; 144; 146   p.148   p.130; 132  p.134; 138   p.170  p.150; 152; 154  p.156; 158; 162; 164; 168  p.204; 208; 210		
		4 days	<b>EOC Review</b>	<b>EOC Review</b>	<b>CTD Reg18 GPS</b>
		5 days	<b>State Testing</b>	<b>State Testing</b>	
		7 days	<b>Final Review and Exam</b>	<b>Final Review and Exam</b>	

