

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Number and Quantity					
CCSS Domain: The Real Number System (N-RN)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Extend the properties of exponents to rational exponents	<p>1. explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational expressions.</p> <p>2. rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	MA1 3.5	Skill/Concept	<p>1. Use properties of exponents (including zero and negative exponents) to evaluate and simplify expressions.</p> <p>2. Use properties of exponents (including zero and negative exponents) to evaluate and simplify expressions.</p> <p>Simplify radicals that have various indices.</p> <p>Use properties of roots and rational exponents to evaluate and simplify expressions.</p> <p>Add, subtract, multiply, and divide expressions containing radicals.</p> <p>Rationalize denominators containing radicals and find the simplest common denominator.</p>	<p>1. Simplify $(-2xy)^3$</p> <p>2. Simplify $\sqrt{x^2y^4}$</p> <p>(SMP 2, 7)</p>

Mathematics Curriculum

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Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Use properties of rational and irrational numbers	3. explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	MA1 3.5	Skill/Concept	<p>3. Use rational numbers to demonstrate knowledge of additive and multiplicative inverses.</p> <p>Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators.</p> <p>Find rational number square roots (without calculators) and approximate irrational square roots (with and without calculators).</p> <p>Evaluate and simplify radical expressions.</p> <p>Multiply radical expressions.</p>	3. Simplify $\sqrt{(72)} + \sqrt{(18)} - \sqrt{(3)}$ (SMP 2, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Number and Quantity					
CCSS Domain: Quantities (N-Q)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Reason quantitatively and use units to solve problems	1. use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	MA5 1.6	Skill/Concept	1. Simplify ratios. Solve mathematical and real-world rational equation problems (e.g., work or rate problems)	If six shirts cost \$35, how much would four shirts cost? (SMP 1, 2)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Number and Quantity					
CCSS Domain: The Complex Number System (N-CN)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Perform arithmetic operations with complex numbers	<p>1. know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.</p> <p>2. use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</p> <p>3. (+) find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers</p>	<p>MA5 1.6</p>	<p>Skill/Concept</p>	<p>1. Identify complex numbers and write their conjugates.</p> <p>Add, subtract, and multiply complex numbers Simplify quotients of complex numbers.</p>	<p>1. Simplify $(2 - i)(3+4i)$ (SMP 7)</p>

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CCSS Conceptual Category: Number and Quantity					
CCSS Domain: The Complex Number System (N-CN)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Use complex numbers in polynomial identities and equations	7. Solve quadratic equations with real coefficients that have complex solutions.	MA5 1.6	Skill/Concept	7. Solve quadratic equations with complex number solutions.	7. Solve $x^2+16=0$.
	9. Apply the Fundamental Theorem of Algebra.			9. Relate factors, solutions (roots), zeros of related functions, and x-intercepts in equations that arise from quadratic functions. Recognize the connection among zeros of a polynomial function, x-intercepts, factors of polynomials, and solutions of polynomial equations.	9. Find the roots of $x^2+5x+6=0$. (SMP 5, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Seeing Structure in Expressions (A-SSE)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Interpret the structure of expressions	<p>1. interpret expressions that represent a quantity in terms of its context.</p> <p>a. interpret parts of an expression, such as terms, factors, and coefficients.</p> <p>b. interpret complicated expressions by viewing one or more of their parts as a single entity.</p> <p>2. use the structure of an expression to identify ways to rewrite it.</p>	<p>MA5</p> <p>1.6</p>	<p>Skill/Concept</p>	<p>1. Add and subtract polynomials.</p> <p>Factor a monomial from a polynomial. Determine characteristics of circles and parabolas from their equations and graphs.</p> <p>Identify and write equations for circles and parabolas from given characteristics and graphs.</p> <p>Recognize the connection among zeros of a polynomial function, x-intercepts, factors of polynomials, and solutions of polynomial equations.</p> <p>Determine characteristics of ellipses and hyperbolas from given equations and graphs.</p> <p>2. Factor perfect square trinomials and the difference of two squares.</p> <p>Factor trinomials in the form $ax^2 + bx + c$.</p> <p>Solve quadratic equations and inequalities using various techniques, including completing the square and using the quadratic formula.</p> <p>Solve polynomial equations using a variety of methods (e.g., factoring, rational roots theorem).</p>	<p>1. Write the correct equation of a circle with center at (3, -4) and a radius of 5.</p> <p>2. Solve $x^2+2x=3$. (SMP 1, 7)</p>

Mathematics Curriculum

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CCSS Conceptual Category: Algebra					
CCSS Domain: Seeing Structure in Expressions (A-SSE)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Write expressions in equivalent forms to solve problems	<p>3. choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>a. factor a quadratic expression to reveal the zeros of the function it defines.</p> <p>b. complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</p> <p>c. use the properties of exponents to transform expressions for exponential functions.</p>	<p>MA5</p> <p>1.6</p>	Skill/Concept	<p>3. Factor a monomial from a polynomial.</p> <p>Factor perfect square trinomials and the difference of two squares.</p> <p>Factor trinomials in the form $ax^2 + bx + c$.</p> <p>Determine characteristics of circles and parabolas from their equations and graphs.</p> <p>Identify and write equations for circles and parabolas from given characteristics and graphs.</p> <p>Determine characteristics of ellipses and hyperbolas from given equations and graphs.</p> <p>Identify and write equations for ellipses and hyperbolas from given characteristics and graphs.</p>	<p>3. Identify the equation of a parabola with a vertical axis of symmetry, with a vertex point of (1, -2), and containing the point (3, 4).</p> <p>(SMP 1, 7)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Arithmetic with Polynomials and Rational Expressions (A-APR)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Perform arithmetic operations on polynomials	<p>1. understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</p> <p>2. know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.</p>	<p>MA5</p> <p>1.6</p>	<p>Skill/Concept</p>	<p>1. Add and subtract polynomials.</p> <p>Multiply monomials, binomials, trinomials, and polynomials.</p> <p>2. Factor polynomials using a variety of methods (e.g., factor theorem, synthetic division, long division, sums and differences of cubes, grouping).</p> <p>Solve polynomial equations using a variety of methods (e.g., factoring, rational roots theorem).</p>	<p>1. Simplify $(2x-3)(3x+4)$.</p> <p>2. Completely factor $2x+4y-6x-12y$.</p> <p>(SMP 1, 7)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Arithmetic with Polynomials and Rational Expressions (A-APR)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Understand the relationship between zeros and factors of polynomials	3. identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	MA5 1.6	Skill/Concept	<p>3. Solve quadratic equations using multiple methods, factoring, and the square root principle.</p> <p>Identify graphs of quadratic functions.</p> <p>Relate factors, solutions (roots), zeros of related functions, and x-intercepts in equations that arise from quadratic functions.</p> <p>Factor polynomials using a variety of methods (e.g., factor theorem, synthetic division, long division, sums and differences of cubes, grouping).</p> <p>Find all rational zeros of a polynomial function.</p> <p>Recognize the connection among zeros of a polynomial function, x-intercepts, factors of polynomials, and solutions of polynomial equations.</p> <p>Use technology to graph a polynomial function and approximate the zeros, minimum, and maximum; determine domain and range of the polynomial function.</p>	3. Identify the correct graph of $f(x)=(2x-1)(3x-6)$. (SMP 1, 7)

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Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Arithmetic with Polynomials and Rational Expressions (A-APR)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Use polynomial identities to solve problems	4. prove polynomial identities and use them to describe numerical relationships.	MA2 1.6	Skill/Concept	4. Identify and use Pythagorean triples in right triangles to find lengths of the unknown side.	4. Given a right triangle with a hypotenuse of 15 and one leg of 9, find the length of the other leg. (SMP 1, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Creating Equations (A-CED)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Create equations that describe numbers of relationships	<p>1. create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</p> <p>2. create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>3. represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p>4. rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>	<p>MA5</p> <p>3.5</p>	<p>Skill/Concept</p>	<p>1. Solve single-step and multistep equations and inequalities in one variable.</p> <p>Solve equations that contain absolute value.</p> <p>Evaluate and simplify rational expressions.</p> <p>Solve compound inequalities containing “and” and “or” and graph the solution set.</p> <p>2. Solve single-step and multistep equations and inequalities in one variable.</p> <p>Solve equations that contain absolute value.</p> <p>Solve quadratic equations using multiple methods, including graphing, factoring, and the square root principle.</p> <p>Evaluate and simplify rational expressions.</p> <p>Solve compound inequalities containing “and” and “or” and graph the solution set.</p> <p>3. Give the domain and range of relations and functions. Evaluate functions at given values.</p> <p>4. Solve formulas for a specified variable.</p>	<p>1. Solve $x-3 <7$.</p> <p>2. If the area of a rectangle is 48 and the length is two more than the width, find the length and the width.</p> <p>3. Find $f(5)$ given $f(x)=3x-9$.</p> <p>4. Given $2x-5y=7$, place in slope-intercept form.</p> <p>(SMP 1, 7)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Reasoning with Equations and Inequalities (A-REI)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Understand solving equations as a process of reasoning and explain the reasoning	2. solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	MA4 1.6	Skill/Concept	2. Solve mathematical and real-world rational equation problems (e.g., work or rate problems). Evaluate expressions and solve equations containing rational exponents.	2. Solve the $\sqrt{x-4}=2x$. (SMP 1, 6)

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Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Algebra					
CCSS Domain: Reasoning with Equations and Inequalities (A-REI)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Solve equations and inequalities in one variable	3. solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.				
	4. solve quadratic equations in one variable. a. use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. b. solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .	MA5 1.6	Skill/Concept	3. Solve single-step and multistep equations and inequalities in one variable. Solve formulas for a specified variable. 4. Solve quadratic equations using multiple methods, including graphing, factoring, and the square root principle. Solve quadratic equations and inequalities using various techniques, including completing the square and using the quadratic formula. Solve quadratic equations with complex number solutions.	3. Solve for L given $P=2L+2W$. 4. Solve $x^2=72$. (SMP 1, 7)

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CCSS Domain: Reasoning with Equations and Inequalities (A-REI)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Solve systems of equations	<p>6. solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</p> <p>7. solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.</p>	<p>MA4</p> <p>1.6</p>	<p>Strategic Thinking</p>	<p>6. Solve systems of two equations using various methods, including elimination, substitution, and graphing with and without technology.</p> <p>7. Solve quadratic systems graphically and algebraically with and without technology.</p>	<p>6. Solve $2x-y=12$ and $4x+2y=24$.</p> <p>7. Given the graph of a system of a line and a parabola, give the solution.</p> <p>(SMP 1, 4)</p>

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CCSS Domain: Reasoning with Equations and Inequalities (A-REI)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Represent and solve equations and inequalities graphically	10. understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	MA4 1.6	Skill/Concept	10. Write linear equations in standard form and slope-intercept form when given two points, a point and the slope, or the graph of the equation. Give the domain and range of relations and functions. Evaluate functions at given values.	10. Given the sketch of a line, identify the equation of the line. (SMP 1, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Interpreting Functions (F-IF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Understand the concept of a function and use function notation	<p>1. understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.</p> <p>2. use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</p> <p>3. recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.</p>	<p>MA4</p> <p>1.6</p>	<p>Skill/Concept</p>	<p>1. Evaluate functions at given values.</p> <p>2. Evaluate functions at given values.</p> <p>Evaluate and simplify rational expressions.</p> <p>Evaluate and simplify radical expressions.</p> <p>3. Find the nth term of an arithmetic or geometric sequence.</p> <p>Find the position of a given term of an arithmetic or geometric sequence.</p>	<p>2. Simplify $(x^2-x-6)/(x^2+x-12)$.</p> <p>3. Given 1, 3, 5,... find the 30th term.</p> <p>(SMP 1, 8)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Interpreting Functions (F-IF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Interpret functions that arise in applications in terms of the context	6. calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	MA4 1.6	Skill/Concept	6. Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description.	6. Given $3x-4y=12$, find the rate of change. (SMP 1, 6)

Mathematics Curriculum

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CCSS Conceptual Category: Functions					
CCSS Domain: Interpreting Functions (F-IF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Analyze functions using different representations	9. compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	MA4 1.6	Strategic Thinking	9. Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description. Translate between different representations of relations and functions: graphs, equations, sets of ordered pairs, verbal descriptions, and tables.	9. Given the sketch of the two following parabolas, correctly describe the translation. (SMP 2, 5)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Building Functions (F-BF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Build new functions from existing functions	<p>3. identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.</p>	<p>MA 4 1.6</p>	<p>Recall</p>	<p>3. determine the effect of reflections, rotations, translations, and dilations and their compositions on the coordinate plane.</p>	<p>3. Given $f(x) = x^2$ and $g(x) = -(x+1)^2 - 3$ describe verbally the transformation.</p> <p>SMP (5,7)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Linear, Quadratic, and Exponential Models (F-LE)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Construct and compare linear, quadratic, and exponential models and solve problems	4. for exponential models, express as a logarithm the solution to $abct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.	MA 5 1.6	Skill/Concept	4. Solve exponential and logarithmic equations involving exponential and logarithmic equations (e.g., compound interest, exponential growth and decay).	4. Solve $\log(1/1000) = x$ SMP (1, 6, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Trigonometric Function (F-TF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Extend the domain of trigonometric functions using the unit circle	5. choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. ★			5. Find the period and amplitude of the sine and cosine functions, given a graph.	

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Functions					
CCSS Domain: Trigonometric Function (F-TF)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Prove and apply trigonometric identities	8. prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	MA 2 2.1	Skill/Concept	<p>8. Apply the Pythagorean Theorem and its converse to triangles to solve mathematical and real-world problems (e.g., shadows and poles, ladders).</p> <p>Find the sine, cosine, and tangent ratios of acute angles given the side lengths of right triangles.</p>	<p>8. A 10 foot ladder is leaning up against a wall with the base of the ladder 4 foot from the base of the house. How is the ladder on the wall?</p> <p>SMP (1, 4, 6)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Congruence (G-CO)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Experiment with transformations in the plane	<p>1. know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</p> <p>2. represent transformations in the plane; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.</p>	<p>MA 2 1.6</p>	<p>Skill/Concept</p>	<p>1. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to solve problems.</p> <p>2. Identify and draw images of transformations and use their properties to solve problems. Reflections, rotations, translations, and dilations and their compositions on the coordinate plane.</p>	<p>1. Given two lines cut by a transversal and various angles determine whether the lines are parallel.</p> <p>2. Given the vertices of a triangle and the function $f(x,y) \rightarrow f'(x - 4, y + 3)$ determine the coordinates of the new vertices.</p> <p>SMP (4, 8)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Congruence (G-CO)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Prove geometric theorems	<p>9. prove theorems about lines and angles.</p> <p>10. prove theorems about triangles.</p>	<p>MA 4 1.6</p>	<p>Skill/Concept</p>	<p>9. Apply properties and theorems of parallel and perpendicular lines to solve problems.</p> <p>10. Apply the Angle Sum Theorem for triangles and polygons to find interior and exterior angle measures given the number of sides, to find the number of sides given angle measures, and to solve real-world problems.</p> <p>Apply the Isosceles Triangle Theorem and its converse to triangles to solve mathematical and real-world problems.</p>	<p>9. Given various sketches of lines cut by a transversal determine if the lines are parallel.</p> <p>10. Given a triangle and two angles find the third angle.</p> <p>SMP (1, 6, 7)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Similarity, Right Triangles, and Trigonometry (G-SRT)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Prove theorems involving similarity	<p>4. prove theorems about triangles.</p> <p>5. use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p>	<p>MA 4 1.6</p>	<p>Skill/Concept</p>	<p>4. Apply the Pythagorean Theorem and its converse to triangles to solve mathematical and real-world problems (e.g., shadows and poles, ladders).</p> <p>5. Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real-world problems.</p>	<p>4. Given a 100 ft. cell tower and a 500 ft. guy wire. Find the distance from the base of the tower to the guy wire.</p> <p>5. Given two similar figures and the perimeters apply the scale factor to find the missing sides.</p> <p>SMP (1, 4)</p>

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CCSS Domain: Similarity, Right Triangles, and Trigonometry (G-SRT)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Define trigonometric ratios and solve problems involving right triangles	<p>6. understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</p> <p>7. explain and use the relationship between the sine and cosine of complementary angles.</p> <p>8. use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. ★</p>	<p>MA 4 1.6</p>	<p>Skill/Concept</p>	<p>6. Apply properties of 45°-45°-90° and 30°-60°-90° triangles to determine lengths of sides of triangles. Find the sine, cosine, and tangent ratios of acute angles given the side lengths of right triangles.</p> <p>7. Find the sine, cosine, and tangent ratios of acute angles given the side lengths of right triangles.</p> <p>8. Apply the Pythagorean Theorem and its converse to triangles to solve mathematical and real-world problems (e.g., shadows and poles, ladders).</p>	<p>6. Given a 30° -60° - 90° triangle and a hypotenuse of 5 find the other two sides.</p> <p>7. Given a right triangle and the side lengths state the sine ratio of <A.</p> <p>8. Given three sides of a triangle determine whether it is a right triangle.</p> <p>SMP (2, 4, 8)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Similarity, Right Triangles, and Trigonometry (G-SRT)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Apply trigonometry to general triangles	10. use the Laws of Sines and Cosines to solve problems.	MA 2 1.6	Skill/Concept	10. Use the law of cosines and the law of sines to find the lengths of sides and measures of angles of triangles in mathematical and real-world problems.	10. Given two triangles, the lengths of two corresponding sides, and one angle opposite one of the given lengths, find the other angle. (SMP 1, 4, 6)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Circles (G-C)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Understand and apply theorems about circles	2. identify and describe relationships among inscribed angles, radii, and chords.	MA 4 1.6	Skill/Concept	2. Determine the measure of central and inscribed angles and their intercepted arcs. Find segment lengths, angle measures, and intercepted arc measures formed by chords, secants, and tangents intersecting inside and outside circles.	2. Given a central angle of 30° , find its intercepted arc. (SMP 1, 6, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Expressing Geometric Properties with Equations (G-GPE)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Translate between the geometric description and the equation for a conic section	<p>1. derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</p> <p>3. derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.</p>	<p>MA 4</p> <p>1.6</p>	Skill/Concept	<p>1. Determine characteristics of circles and parabolas from their equations and graphs.</p> <p>Identify and write equations for circles and parabolas from given characteristics and graphs.</p> <p>3. Identify and write equations for ellipses and hyperbolas from given characteristics and graphs.</p>	<p>1. Given a center of (5, -2) and radius of $\sqrt{7}$, write the equation of a circle.</p> <p>3. Given $x^2/4 + (y-2)^2/9 = 1$, identify the center, vertices, and length of major and minor axes.</p> <p>(SMP 1, 2, 4)</p>

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Expressing Geometric Properties with Equations (G-GPE)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Use coordinates to prove simple geometric theorems algebraically	4. use coordinates to prove simple geometric theorems algebraically.			4. Use coordinate geometry to solve problems about geometric figures (e.g., segments, triangles, quadrilaterals).	4. Given the coordinates of a midpoint and endpoint, find the other endpoint.
	5. prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.			5. Apply properties and theorems of parallel and perpendicular lines to solve problems. Use slope to distinguish between and write equations for parallel and perpendicular lines.	5. Given the equation of two lines, determine if they are parallel, perpendicular, or neither.
	6. find the point on a directed line segment between two given points that partitions the segment in a given ratio.	MA 2 1.6, 3.4	Skill/Concept	6. Apply the midpoint and distance formulas to points and segments to find midpoints, distances, and missing information. Use coordinate geometry to solve problems about geometric figures (e.g., segments, triangles, quadrilaterals).	6. Given two points, find the distance between them.
	7. use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.			7. Apply the midpoint and distance formulas to points and segments to find midpoints, distances, and missing information. Use coordinate geometry to solve problems about geometric figures (e.g., segments, triangles, quadrilaterals).	7. Given a rectangle on a coordinate plane, find the area. (SMP 1, 2, 4)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Geometry					
CCSS Domain: Geometric Measurement and Dimension (G-GMD)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
<i>The students will:</i>					
Explain volume formulas and use them to solve problems	3. use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	MA 2 1.6	Skill/Concept	3. Find the lateral area, surface area, and volume of prisms, cylinders, cones, and pyramids in mathematical and real-world settings.	3. Given the dimensions of a rectangular solid, find the volume. (SMP 1, 4, 6)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Statistics and Probability					
CCSS Domain: Interpreting Categorical and Quantitative Data (S-ID)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Interpret linear models	7. interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	MA 4 1.6	Skill/Concept	7. Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description.	7. Given $2x-4y=8$, find the slope. (SMP 1, 2, 6)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Statistics and Probability					
CCSS Domain: Making Inferences and Justifying Conclusions (S-IC)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Understand and evaluate random processes underlying statistical experiments	2. decide if a specified model is consistent with results from a given data generating process, e.g., using simulation.	MA 3 1.6	Skill/Concept	2. Find the probability of a simple event. Find the probability of independent and dependent events.	2. Given a jar of marbles of various colors and given quantities, find the probability of choosing a specific color. (SMP 1, 4, 6, 7)

Mathematics Curriculum

Subject Area: ACT Prep 11th & 12th					
CCSS Conceptual Category: Statistics and Probability					
CCSS Domain: Conditional Probability and the Rules of Probability (S-CP)					
Show-Me Standards					
CCSS Cluster	Common Core Standard (D)=District Standard	Show Me Standards	DOK	Instructional Strategies Student Activities/Resources	Assessment
	<i>The students will:</i>				
Use the rules of probability to compute probabilities of compound events in a uniform probability model	9. use permutations and combinations to compute probabilities of compound events and solve problems.	MA 3 1.6	Skill/Concept	9. Use counting techniques, like combinations and permutations, to solve problems (e.g., to calculate probabilities).	9. Choose a committee of three from a class of 25, in how many ways can the committee be chosen? (SMP 1, 4, 6)