



The contents below are taken from the High School Assessment Program (HSAP).

### Curriculum Guidelines: Math (HSAP)

<b>Number Operations</b>	
<b>N1</b>	<b>The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.</b> <ul style="list-style-type: none"><li>• Represent a number using scientific notation in applied situations.</li><li>• Find square roots.</li><li>• Find the value of numbers using exponents (e.g., <math>2^9</math>, <math>10^6</math>).</li><li>• Represent a percent as a decimal or fraction and vice versa.</li><li>• Use number sense.</li><li>• Compare and order fractions, decimals, and percents.</li><li>• Apply the commutative, associative, distributive, equality, and identity properties, including order of operations, to simplify mathematical expressions, equations, and inequalities.</li><li>• Justify the steps in solving equations and inequalities.</li></ul>
<b>N2</b>	<b>The student will compute with rational numbers and make reasonable estimates in applied situations.</b> <ul style="list-style-type: none"><li>• Add, subtract, multiply, and divide rational numbers (e.g., fractions, decimals, percents, integers) in real-world situations.</li><li>• Use computational skills to solve applied problems with ratios and proportions.</li><li>• Perform operations of addition, subtraction, and scalar multiplication to solve problems using matrices in applied situations.</li><li>• Use rounding skills to estimate computations.</li><li>• Determine mathematically reasonable solutions using supporting data.</li></ul>

<b>Algebra</b>	
<b>A1</b>	<b>The student will understand and apply patterns, relations, and functions.</b> <ul style="list-style-type: none"><li>• Find the next term of a pattern or sequence.</li><li>• Generalize a pattern.</li><li>• Describe, extend, analyze, and create a wide variety of patterns to investigate relationships and solve problems.</li><li>• Interpret situations in terms of given graphs.</li><li>• Identify situations that can and cannot be represented by a line. Understand the effects of changing the slope and y-intercept on graphs, linear equations, and in applied situations.</li><li>• Use the laws of exponents.</li></ul>
<b>A2</b>	<b>The student will represent, analyze, and model situations using mathematical structures and algebraic symbols.</b> <ul style="list-style-type: none"><li>• Evaluate expressions.</li><li>• Find specific function values.</li><li>• Simplify polynomial expressions.</li><li>• Perform polynomial arithmetic.</li><li>• Use symbols to represent unknowns.</li><li>• Translate an expression, equation, or inequality from words and vice versa.</li><li>• Represent and translate linear functions as equations and inequalities from tables, and graphs, and vice versa.</li><li>• Identify a linear equation given characteristics of the line.</li><li>• Solve linear equations.</li><li>• Solve linear inequalities.</li><li>• Solve systems of linear equations.</li><li>• Solve simple quadratic equations.</li></ul>

<b>Measurement and Geometry</b>	
<b>MG1</b>	<p><b>The student will apply appropriate techniques, tools, and formulas to determine measurements and solve problems.</b></p> <ul style="list-style-type: none"> <li>• Find the perimeter and area of 2-dimensional figures.</li> <li>• Use formulas to find volume and surface areas of 3-dimensional objects (e.g., prisms, pyramids, cylinders).</li> <li>• Approximate and find volumes and areas for irregular figures.</li> <li>• Use dimensional analysis to convert units and check measurement computations.</li> <li>• Convert and use appropriate units of measure (customary and metric).</li> </ul>
<b>MG2</b>	<p><b>The student will analyze characteristics of two- and three-dimensional geometric shapes, understand geometric relationships, and apply spatial relationships using coordinate geometry.</b></p> <ul style="list-style-type: none"> <li>• Identify and apply properties of circles, polygons, and angles.</li> <li>• Analyze the properties of spheres, cylinders, prisms and pyramids.</li> <li>• Identify attributes of congruent figures.</li> <li>• Identify attributes of similar figures.</li> <li>• Use proportions to solve problems involving similar figures, including scale drawings.</li> <li>• Identify the congruent and supplementary relationships of the angles formed by parallel lines and a transversal.</li> <li>• Determine the resulting change in area and volume of a figure when one or more dimensions are changed.</li> <li>• Solve applied problems using the Pythagorean Theorem.</li> <li>• Given two points, find the slope between them.</li> <li>• Identify missing coordinates needed to form a specific polygon.</li> <li>• Translate, reflect, rotate, and dilate figures on the coordinate plane.</li> </ul>

<b>Data Analysis and Probability</b>	
<b>DP1</b>	<p><b>The student will use appropriate statistical methods to analyze data and apply basic concepts of probability.</b></p> <ul style="list-style-type: none"> <li>• Histograms, stem-and-leaf plots, box-and-whisker plots, and matrices.</li> <li>• Determine positive, negative, or no correlation between data.</li> <li>• Find the equation of the line that best fits a set of data (line of best fit).</li> <li>• Determine the line of best fit.</li> <li>• Identify the graph of the function that best models a data set.</li> <li>• Find the mean, median, mode, and range for a set of data.</li> <li>• Find the number of possible outcomes of an event.</li> <li>• Represent possible outcomes in the form of an organized list, chart, or tree diagram.</li> <li>• Calculate the probability of a simple event.</li> <li>• Calculate the probability of a complementary event.</li> </ul>

<b>Integrated Response Questions</b>	
<p><b>The test will include three integrated-response questions (IRs). IRs are 3-point constructed-response items that integrate content standards and process standards. IRs require students to use the process skills of problem solving, communication, representations, and connections to apply a solution strategy, and communicate and represent the result.</b></p>	