

SAUSALITO MARIN CITY SCHOOL DISTRICT
Mathematics Standards - GRADE 8

Students use properties of numbers to demonstrate that assertions are true or false. Students solve equations and inequalities involving absolute values.

Students simplify expressions prior to solving linear equations and inequalities in one variable such as $3(2x-5) + 4(x-2) = 12$.

Students solve multi-step problems, including word problems, involving linear equations and linear inequalities in one variable, with justification of each step.

Students graph a linear equation, and compute the x- and y- intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., sketch the region defined by $2x + 6y < 4$).

Students verify that a point lies on a line given an equation of the line. Students are able to derive linear equations using the point-slope formula.

Students understand the concepts of parallel and perpendicular lines and how their slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.

Students solve a system of two linear equations in two variables algebraically, and are able to interpret the answer graphically. Students are able to use this to solve a system of two linear inequalities in two variables, and to sketch the solutions sets.

Students add, subtract, multiply and divide monomials and polynomials. Students solve multistep problems, including word problems, using these techniques.

Students apply basic factoring techniques to second and simple third degree polynomials. These techniques include finding a common factor to all of the terms in a polynomial and recognizing the difference of two squares, and recognizing perfect squares of binomials.

Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing to lowest terms.

Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems using these techniques.

Students solve a quadratic equation by factoring or completing the square.

Students apply algebraic techniques to rate problems, work problems, and percent mixture problems.

Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.

Students determine the domain of independent variables, and range of dependent variables defined by a graph, a set of ordered pairs, or symbolic expression.

Students determine whether a relation defined by a graph, a set of ordered pairs, or symbolic expression is a function and justify the conclusion.

Students know the quadratic formula and are familiar with its proof by completing the square.

Students use the quadratic formula to find the roots of a second degree polynomial and to solve quadratic equations.

Students graph quadratic functions and know that their roots are the x-intercepts.

Students use the quadratic formula and/or factoring techniques to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.

Students know, derive, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres.

Students compute areas of polygons including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.

Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle.

Students use trigonometric functions to solve for an unknown side of a right triangle, given an angle and a side.

Students are adept at operations on polynomials, including long division

Students perform addition on matrices and vectors.

Students demonstrate understanding that linear systems are either inconsistent (no solutions), have exactly one solution, or have infinitely many solutions.

Students interpret the solution sets of systems of equations geometrically. For example, the solution set of a single linear equation in two variables is interpreted as a line in the plane, and the solution set of a two by two system is interpreted as the intersection of a pair of lines in the plane.

Students know the definition of the notion of independent events, and can use the addition, multiplication, and complementation rules to solve for probabilities of particular events in finite sample spaces.

Students know the definition of conditional probability, and use it to solve for probabilities in finite sample spaces.

Students know the definitions of the mean, median, and mode of distribution of real valued data, and can compute them in particular situations.

Students organize and describe distributions of data using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem and leaf displays, scatter plots, and box and whisker plots.