

Algebra I

2011-2012 Benchmark Blueprint

Green Dot Public Schools

Assessments

| Algebra I | 1 | 2 | 3 | 4 |
|---|----------|----------|----------|----------|
| 1.0 Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable. •1: only distributive property and inverse operations | 3 | | | |
| 2.0 Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents. •1: only opposite and reciprocal •3: only rules of exponents | 3 | | 3 | |
| 3.0 Students solve equations and inequalities involving absolute values. •1: equations only | 3 | | | |
| 4.0 Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x - 5) + 4(x - 2) = 12$. •1: only equations •2: only inequalities | 4 | 3 | | 3 |
| 5.0 Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step. •1: no fractions •2: only variables on both sides •3: only inequalities | 5 | 3 | 3 | 3 |
| 6.0 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., they sketch the region defined by $2x + 6y < 4$). •2: only slope intercept form •4: only inequalities | | 4 | | 3 |
| 7.0 Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula. | | 4 | | 3 |
| 8.0 Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point. | | 3 | | |
| 9.0 Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets. •2: only equations •3: only inequalities | | 4 | 3 | 3 |
| 10.0 Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques. •1: only add and subtract | 3 | 3 | 3 | 3 |



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Assessments

| Algebra I (continued) | 1 | 2 | 3 | 4 |
|--|-----------|-----------|-----------|-----------|
| 11.0 Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. •3: only $a > 1$ •4: only third degree | | | 3 | 3 |
| 12.0 Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms. •3: only $a > 1$ •4: only third degree | | | 3 | 3 |
| 13.0 Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques. | | | | 3 |
| 14.0 Students solve a quadratic equation by factoring or completing the square. •3: only $a > 1$ •4: only third degree | | | 3 | 3 |
| 15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems. | | | | 3 |
| 19.0 Students know the quadratic formula and are familiar with its proof by completing the square. | | | | 3 |
| 20.0 Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations. | | | 5 | 3 |
| 21.0 Students graph quadratic functions and know that their roots are the x-intercepts. •3: only roots and x-intercepts | | | 3 | |
| 22.0 Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points. | | | 3 | |
| 23.0 Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity. | | | 3 | |
| 24.3 Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. | | | | 3 |
| 25.3 Given a specific algebraic statement involving linear, quadratic or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never. | | 3 | | |
| Total Number of Items | 21 | 27 | 35 | 42 |