

Middle School Learning Targets

8th Grade Social Algebra I Learning Targets

1. Reason Quantitatively and Use Units to Solve Problems.

- a) I can use units as a way to understand problems and guide the solution of multi-step problems (dimensional analysis).
- b) I can choose and interpret units consistently in formulas.
- c) I can choose and interpret the scale and origin in graphs and data displays.
- d) I can define appropriate quantities for the purpose of descriptive modeling.
- e) I can choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

2. Create and solve equations.

- a) I can simplify and evaluate expressions using the Order of Operations.
- b) I can translate verbal expressions into algebraic expressions.
- c) I can translate verbal sentences into equations or inequalities (don't solve).
- d) I can solve two-step equations using inverse operations.
- e) I can solve multi-step equations which involve combining like terms.
- f) I can solve multi-step equations using the Distributive Property.
- g) I can solve multi-step equations with variables on both sides.
- h) I can solve proportions using the Cross-product Property.
- i) I can write one variable equations to model and solve real-world situations.
- j) I can solve a literal equation (formula) for a specified variable using inverse operations.
- k) I can solve and graph absolute value equations, finding both solutions using inverse operations.
- l) I can graph and analyze important characteristics of absolute value functions.
- m) I can describe transformations of the parent absolute value function, $f(x)=x$.

3. Apply concepts related to functions.

- a) I can identify the domain and range of a relation.
- b) I can determine if a relation is a function from a table of values, a set of ordered pairs, a mapping or a graph.
- c) I can evaluate a function using function notation (e.g., $f(x)$).
- d) I can write a linear function (equation) from a table.
- e) I can sketch a graph to represent a verbal description.
- f) I can model real-world situations by writing a linear function (equation).
- g) I can identify the appropriate domain and range for given real-world situations.
- h) I can identify discrete and continuous functions using graphs, tables, or verbal descriptions from real-world situations.
- i) I can identify dependent and independent variables in real-world situations.

4. Create, graph and interpret linear equations.

- a) I can describe the graph of a line as the set of all its solutions plotted in the coordinate plane.
- b) I can graph a line given a table of values.
- c) I can identify linear functions by examining the equation or graph.
- d) I can identify key features of graphs and tables (e.g., x- and y-intercepts, end behavior, increasing/decreasing (positive/negative), and slope).
- e) I can calculate the x- and y-intercept of a given equation.
- f) I can graph a linear equation using the x- and y-intercept.
- g) I can graph a linear equation from slope-intercept form or standard form.
- h) I can graph vertical and horizontal lines.
- i) I can graph and interpret a piecewise function (not including step functions).

- j) I can write a linear equation given a graph.
- k) I can write and graph linear equations (including direct variation) from verbal descriptions for real-world situations.
- l) I can calculate and interpret the average rate of change (slope) from real-world situations.
- m) I can write the equation of a line in point-slope form.
- n) I can translate a linear equation written in point-slope form to slope-intercept form and then to standard form.
- o) I can write the equation of a line in slope-intercept form given two points.
- p) I can write the equation of a line in standard form given two points.
- q) I can write linear equations of parallel and perpendicular lines.
- r) I can write the equation of a horizontal or vertical lines given a table of values or a graph.
- s) I can translate between the different representations of relations. (e.g., graphs, equations, tables, verbal descriptions, and ordered pairs)
- t) I can graph and analyze important characteristics of absolute value functions in two variables.
- u) I can solve a system of equations by graphing with and without technology.
- v) I can solve a system of equations by substitution.
- w) I can solve a system of equations by elimination (without multiplication).
- x) I can solve a system of equations by elimination (with multiplication).
- y) I can model and solve real-world situations using systems of equations.

5. Create, graph and interpret inequalities in one and two variables.

- a) I can graph linear inequalities in one variable on a number line.
- b) I can solve one-step linear inequalities in one variable using inverse operations.

- c) I can solve multi-step linear inequalities in one variable using inverse operations.
- d) I can write inequalities and use them to solve real-world situations.
- e) I can solve and graph inequalities in one variable involving absolute values.
- f) I can solve and graph compound inequalities in one variable on a number line.
- g) I can graph a linear inequality in two variables from slope-intercept or standard form.
- h) I can create linear inequalities to solve real-world situations.
- i) I can describe and write appropriate constraints and interpret their meaning in the context of real-world situations involving linear inequalities.
- j) I can graph systems of linear inequalities.
- k) I can model and solve real-world situations using systems of linear inequalities.
- l) I can recognize a system of linear inequalities as having no solution, one solution, or infinitely many solutions (both graphically and algebraically).
- m) I can graph and interpret step functions.

6. Construct and compare linear and exponential models and solve problems.

- a) I can evaluate exponential expressions using the Product of Powers Property.
- b) I can evaluate exponential expressions using the Power of a Power Property.
- c) I can evaluate exponential expressions using the the Power of a Product Property.
- d) I can evaluate exponential expressions using the Quotient of Powers Property.
- e) I can evaluate exponential expressions using the Power of a Quotient Property.

- f) I can evaluate expressions with zero and negative exponents.
- g) I can identify and interpret parts of an exponential function (starting amount, growth or decay factor).
- h) I can write and solve real-world situations using exponential functions.
- i) I can interpret the key features of graphs and tables representing exponentials functions (end behavior, increasing/decreasing, domain/range).
- j) I can graph exponential functions.
- k) I can compare linear and exponential functions using graphs, tables, equations and real-world situations.
- l) I can recognize that arithmetic sequences are linear functions and geometric sequences are exponential functions.
- m) I can identify and write equations for arithmetic and geometric sequences.
- n) I can describe transformations of the parent exponential function, $f(x)=ab^x$.

7. Apply arithmetic operations to polynomials.

- a) I can interpret parts of an expression, such as terms, factors, and coefficients.
- b) I can add and subtract polynomials.
- c) I can multiply polynomials.
- d) I can multiply binomials with special products (difference of two squares, perfect square trinomials)
- e) I can divide polynomials by monomials.

8. Factoring and solving polynomials.

- a) I can factor polynomials by identifying the greatest common factor.
- b) I can factor polynomials using the grouping method.
- c) I can identify and factor the difference of two squares.

- d) I can identify and factor perfect square trinomials.
- e) I can factor polynomials of the form x^2+bx+c .
- f) I can factor polynomials of the form ax^2+bx+c .
- g) I can completely factor polynomials using any method(s) for factoring.
- h) I can solve real-world quadratic situations by factoring.
- i) I can solve quadratic functions by factoring and applying the Zero Product Property to reveal the zeros of the function.
- j) I can solve quadratic functions using the square root method (no "b" term).
- k) I can solve quadratic functions by completing the square.
- l) I can recognize that the Quadratic Formula can be derived from $ax^2+bx+c=0$ by completing the square and solving for x .
- m) I can determine the number of roots using the discriminant.
- n) I can solve quadratic functions using the quadratic formula.
- o) I can solve and interpret quadratic functions resulting from real-world situations (approximating irrational solutions).

9.Explore and analyze quadratic functions and graphs.

- a) I can graph quadratic functions by creating a table of input and output values.
- b) I can identify important characteristics of quadratic functions by analyzing their equations (standard and vertex forms).
- c) I can graph quadratic functions using important characteristics; including roots, y -intercepts, axis of symmetry, and vertex point (from standard and vertex forms).
- d) I can identify important characteristics of quadratic functions given their graphs.
- e) I can write a quadratic function in standard form when given its graph or its roots.

- f) I can write the equation of a quadratic function in vertex form given the vertex and a single point.
- g) I can transform the equation of a quadratic function from standard to vertex form by completing the square.
- h) I can solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
- i) I can compare linear, exponential, and quadratic functions using graphs, tables, equations and real-world situations.
- j) I can describe transformations on the parent quadratic function, $f(x)=x^2$.

10. Apply arithmetic operations to rational expressions.

- a) I can evaluate and simplify rational expressions.
- b) I can multiply and divide rational expressions.
- c) I can add and subtract rational expressions.

11. Apply arithmetic operations to radicals.

- a) I can approximate irrational square roots with and without technology.
- b) I can evaluate and simplify radical expressions.
- c) I can multiply radical expressions.
- d) I can simplify an algebraic quotient by rationalizing an irrational monomial denominator.
- e) I can graph and interpret a square root function.
- f) I can graph and interpret a cubed root function.
- g) I can apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems. [8th grade]
- h) I can apply the Pythagorean Theorem to find the distance between two points on a coordinate system (Distance Formula). [8th grade]

12. Compare various methods of data recording to make inferences, predictions, and to estimate probabilities.

- a) I can represent data with dot plots, histograms, and box-and-whisker plots.
- b) I can summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation).
- c) I can use statistics to compare center (median and mean) and spread (standard deviation) of two or more data sets.
- d) I can interpret differences in shape, center, and spread to determine possible effects of extreme data points (outliers).
- e) I can interpret and summarize data in two-way frequency tables in order to recognize possible trends in the data.
- f) I can construct and interpret scatter plots using the line of best fit to investigate patterns of association between the two quantities [8th grade].
- g) I can use the equation of a linear model to solve problems, interpreting the slope and intercept in context of data [8th grade].
- h) I can construct, interpret, and summarize data in two-way frequency tables in order to recognize trends in the data. [8th grade].
- i) I can represent data of two variables on a scatter plot and describe how the variables are related (emphasize linear, exponential, and quadratic models).
- j) I can interpret the slope (rate of change) and intercept (constant term/starting point) of a linear model in the context of the data.
- k) I can distinguish between independent and dependent events.
- l) I can calculate the probability of two independent or dependent events.