Correlation of the ALEKS course Algebra 1 to the Washington Algebra 1 Standards

A1.1: Core Content: Solving Problems

- [ ] ALEKS course topic that addresses the standard

A1.1.A: Select and justify functions and equations to model and solve problems.

- Finding a function rule: Problem type 1
- Finding a function rule: Problem type 2
- Writing equations and drawing graphs to fit a narrative

A1.1.B: Solve problems that can be represented by linear functions, equations, and inequalities.

- Solving a word problem using a linear equation: Problem type 1
- Solving a word problem using a linear equation: Problem type 2
- Solving a word problem using a linear equation: Problem type 3
- Solving a word problem using a linear equation: Problem type 4
- Solving a word problem using a system of linear equations: Problem type 1
- Solving a word problem using a system of linear equations: Problem type 2
- Solving a word problem using a system of linear equations: Problem type 3
- Solving a word problem using a system of linear equations: Problem type 4
- Solving a word problem using a system of linear inequalities
- Application problem with a linear function: Problem type 1
- Application problem with a linear function: Problem type 2
- Word problem on rates

A1.1.C: Solve problems that can be represented by a system of two linear equations or inequalities

- Solving a word problem using a system of linear equations: Problem type 1
- Solving a word problem using a system of linear equations: Problem type 2
- Solving a word problem using a system of linear equations: Problem type 3
- Solving a word problem using a system of linear equations: Problem type 4
- Solving a word problem using a system of linear equations: Problem type 5
- Solving a word problem using a system of linear inequalities

A1.1.D: Solve problems that can be represented by quadratic functions and equations.

- Solving a word problem using a quadratic equation with rational roots
- Solving a word problem using a quadratic equation with irrational roots

A1.1.E: Solve problems that can be represented by exponential functions and equations.

- Solving a word problem using an exponential equation: Problem type 1

A1.2: Core Content: Numbers, expressions, and operations
A1.2.A: Know the relationship between real numbers and the number line, and compare and order real numbers with and without the number line.

- Ordering fractions
- Ordering decimals
- Ordering fractions and decimals
- Plotting integers on a number line
- Plotting rational numbers on a number line
- Ordering numbers with positive exponents
- Ordering numbers with negative exponents

A1.2.B: Recognize the multiple uses of variables, determine all possible values of variables that satisfy prescribed conditions, and evaluate algebraic expressions that involve variables.

- Evaluation of a linear expression in two variables
- Evaluation of a polynomial in one variable

A1.2.C: Interpret and use integer exponents and square and cube roots, and apply the laws and properties of exponents to simplify and evaluate exponential expressions.

- Introduction to exponents
- Evaluating expressions with exponents: Problem type 1
- Evaluating expressions with exponents: Problem type 2
- Exponents and order of operations
- Product rule of exponents
- Quotients of expressions involving exponents
- Power rule with positive exponents
- Writing a positive number without a negative exponent
- Writing a negative number without a negative exponent
- Power rule with negative exponents: Problem type 1
- Product rule of exponents in a multivariate monomial
- Square root of a perfect square
- Square root of a rational perfect square
- Square root simplification
- Square root of a perfect square monomial
- Simplifying a radical expression: Problem type 1
- Simplifying a radical expression: Problem type 2
- Square root addition
- Square root multiplication
- Simplifying a product of radical expressions using the distributive property
- Rationalizing the denominator of a radical expression
- Rationalizing the denominator of a radical expression using conjugates

A1.2.D: Determine whether approximations or exact values of real numbers are appropriate, depending on the context, and justify the selection.

N/A

A1.2.E: Use algebraic properties to factor and combine like terms in polynomials.

- Combining like terms: Advanced
- Factoring a quadratic with leading coefficient 1
- Factoring a quadratic with leading coefficient greater than 1
- Factoring a perfect square
- Factoring a quadratic polynomial in two variables
- Factoring a product of a quadratic trinomial and a monomial
- Factoring a difference of squares
- Factoring with repeated use of the difference of squares formula
- Factoring a multivariate polynomial by grouping: Problem type 1
- Factoring a multivariate polynomial by grouping: Problem type 2

A1.2.F: Add, subtract, multiply, and divide polynomials.

- Simplifying a polynomial expression
- Multiplying monomials
- Multiplying binomials: Problem type 1
- Squaring a binomial
- Multiplying polynomials
- Simplifying a ratio of polynomials: Problem type 1
- Simplifying a ratio of polynomials: Problem type 2
- Ratio of multivariate polynomials
- Polynomial long division: Problem type 1

A1.3: Core Content: Characteristics and behaviors of functions

- = ALEKS course topic that addresses the standard

A1.3.A: Determine whether a relationship is a function and identify the domain, range, roots, and independent and dependent variables.

- Independent and dependent variables
- Domain and range from ordered pairs
- Domain of a square root function
- Vertical line test

A1.3.B: Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations.

- Function tables with two-step rules
- Function tables
- Graphing integer functions
- Graphing a line given its equation in slope-intercept form
- Graphing a line given its equation in standard form
- Writing equations and drawing graphs to fit a narrative
- Graphing an equation involving absolute value in the plane
- Graphing a parabola: Problem type 1
- Graphing a parabola: Problem type 2
- Graphing a parabola: Problem type 3

A1.3.C: Evaluate f(x) at a (i.e., f(a)) and solve for x in the equation f(x) = b.

- Function tables
- Graphing integer functions
A1.4: Core Content: Linear functions, equations, and inequalities

- A1.4.A: Write and solve linear equations and inequalities in one variable.
  - Additive property of equality with whole numbers
  - Additive property of equality with integers
  - Additive property of equality with a negative coefficient
  - Additive property of equality with decimals
  - Multiplicative property of equality with whole numbers
  - Multiplicative property of equality with signed fractions
  - Solving a fraction word problem using a simple linear equation
  - Solving a two-step equation with integers
  - Solving a two-step equation with signed fractions
  - Solving an equation to find the value of an expression
  - Solving a linear equation with several occurrences of the variable: Problem type 1
  - Solving a linear equation with several occurrences of the variable: Problem type 2
  - Solving a linear equation with several occurrences of the variable: Problem type 3
  - Solving a linear equation with several occurrences of the variable: Problem type 4
  - Solving a linear equation with several occurrences of the variable: Problem type 5
  - Writing an inequality
  - Writing a compound inequality
  - Solving a linear inequality: Problem type 1
  - Solving a linear inequality: Problem type 2
  - Solving a linear inequality: Problem type 3
  - Solving a linear inequality: Problem type 4

A1.4.B: Write and graph an equation for a line given the slope and the y-intercept, the slope and a point on the line, or two points on the line, and translate between forms of linear equations.
  - Graphing a line given its equation in slope-intercept form
  - Graphing a line given its equation in standard form
  - Graphing a line through a given point with a given slope
  - Writing an equation of a line given the y-intercept and a point
  - Writing the equation of a line given the slope and a point on the line
  - Writing the equation of the line through two given points

A1.4.C: Identify and interpret the slope and intercepts of a linear function, including equations for parallel and perpendicular lines.
  - Writing equations and drawing graphs to fit a narrative
  - Y-intercept of a line
  - Finding x- and y-intercepts of a line given the equation in standard form
  - Finding slope given the graph of a line on a grid
  - Finding the slope of a line given its equation
  - Slopes of parallel and perpendicular lines: Problem type 1
  - Slopes of parallel and perpendicular lines: Problem type 2
  - Application problem with a linear function: Problem type 1
  - Application problem with a linear function: Problem type 2

A1.4.D: Write and solve systems of two linear equations and inequalities in two variables.
A1.4.E: Describe how changes in the parameters of linear functions and functions containing an absolute value of a linear expression affect their graphs and the relationships they represent.

- Writing an equation for a function after a vertical and horizontal translation
- Graphing an equation involving absolute value in the plane

A1.5: Core Content: Quadratic functions and equations

- = ALEKS course topic that addresses the standard

A1.5.A: Represent a quadratic function with a symbolic expression, as a graph, in a table, and with a description, and make connections among the representations.

- Solving a word problem using a quadratic equation with irrational roots
- How the leading coefficient affects the shape of a parabola
- Graphing a parabola: Problem type 1
- Graphing a parabola: Problem type 2
- Graphing a parabola: Problem type 3

A1.5.B: Sketch the graph of a quadratic function, describe the effects that changes in the parameters have on the graph, and interpret the x-intercepts as solutions to a quadratic equation.

- Writing an equation for a function after a vertical translation
- Writing an equation for a function after a vertical and horizontal translation
- Finding the x-intercept(s) and the vertex of a parabola
- How the leading coefficient affects the shape of a parabola
- Graphing a parabola: Problem type 1
- Graphing a parabola: Problem type 2
- Graphing a parabola: Problem type 3

A1.5.C: Solve quadratic equations that can be factored as \((ax + b)(cx + d)\) where \(a, b, c,\) and \(d\) are integers.

- Solving equations written in factored form
- Finding the roots of a quadratic equation with leading coefficient 1
- Finding the roots of a quadratic equation with leading coefficient greater than 1
- Solving a quadratic equation needing simplification
A1.5.D: Solve quadratic equations that have real roots by completing the square and by using the quadratic formula.

- Solving a quadratic equation using the quadratic formula
- Solving a word problem using a quadratic equation with irrational roots

A1.6: Core Content: Data and distributions

- = ALEKS course topic that addresses the standard

A1.6.A: Use and evaluate the accuracy of summary statistics to describe and compare data sets.

- Mode of a data set
- Mean and median of a data set
- Choosing the best measure to describe data

A1.6.B: Make valid inferences and draw conclusions based on data.

- Making reasonable inferences based on proportion statistics
- Introduction to expectation

A1.6.C: Describe how linear transformations affect the center and spread of univariate data.

Topic covered in ALEKS AP Statistics

A1.6.D: Find the equation of a linear function that best fits bivariate data that are linearly related, interpret the slope and y-intercept of the line, and use the equation to make predictions.

Topic covered in ALEKS AP Statistics

A1.6.E: Describe the correlation of data in scatterplots in terms of strong or weak and positive or negative.

- Scatterplots and correlation

A1.7: Additional Key Content

- = ALEKS course topic that addresses the standard

A1.7.A: Sketch the graph for an exponential function of the form $y = ab^n$ where $n$ is an integer, describe the effects that changes in the parameters $a$ and $b$ have on the graph, and answer questions that arise in situations modeled by exponential functions.

- Solving a word problem using an exponential equation: Problem type 1

A1.7.C: Express arithmetic and geometric sequences in both explicit and recursive forms, translate between the two forms, explain how rate of change is represented in each form, and use the forms to find specific terms in the sequence.

- Arithmetic sequence
- Geometric sequence
- Arithmetic and geometric sequences: Identifying and writing in standard form

A1.7.D: Solve an equation involving several variables by expressing one variable in terms of the others.

- Introduction to algebraic symbol manipulation
- Algebraic symbol manipulation

A1.8: Core Processes

- = ALEKS course topic that addresses the standard

A1.8.A: Analyze a problem situation and represent it mathematically.

- Writing a mathematical expression
- Translating sentences into equations
- Solving a word problem using a linear equation: Problem type 1
- Solving a word problem using a linear equation: Problem type 2
- Solving a word problem using a linear equation: Problem type 3
- Solving a word problem using a linear equation: Problem type 4
- Translating sentences into inequalities
- Word problem with linear inequalities
- Writing equations and drawing graphs to fit a narrative
- Solving a word problem using a system of linear equations: Problem type 1
- Solving a word problem using a system of linear equations: Problem type 2
- Solving a word problem using a system of linear equations: Problem type 3
- Solving a word problem using a system of linear equations: Problem type 4
- Solving a word problem using a system of linear equations: Problem type 5
- Solving a word problem using a system of linear equations: Problem type 6
- Solving a word problem using a system of linear equations: Problem type 7
- Solving a word problem using a system of linear equations: Problem type 8
- Solving a word problem using a system of linear equations: Problem type 9
- Solving a word problem using a system of linear equations: Problem type 10
- Solving a word problem using a quadratic equation with rational roots
- Word problem on direct variation
- Solving a word problem using an exponential equation: Problem type 1
- Solving equations involving vertical angles
- Perimeters and side lengths with variables
- Area and perimeter of a rectangle
- Area between two rectangles
- Rate of filling of a solid
- Finding the value for a new score that will yield a given mean

A1.8.B: Select and apply strategies to solve problems.

- Simple word problem on proportions
- Word problem on percentage: Problem type 1
- Word problem on percentage: Problem type 2
- Word problem on percentage: Problem type 3
- Simple interest
- Solving a word problem using a linear equation: Problem type 1
- Solving a word problem using a linear equation: Problem type 2
- Solving a word problem using a linear equation: Problem type 3
- Solving a word problem using a linear equation: Problem type 4
- Translating sentences into inequalities
- Word problem with linear inequalities
- Application problem with a linear function: Problem type 1
- Application problem with a linear function: Problem type 2
- Solving a word problem using a system of linear equations: Problem type 1
- Solving a word problem using a system of linear equations: Problem type 2
- Solving a word problem using a system of linear equations: Problem type 3
- Solving a word problem using a system of linear equations: Problem type 4
- Solving a word problem using a system of linear equations: Problem type 5
- Solving a word problem using a quadratic equation with rational roots
- Word problem on proportions: Problem type 1
- Word problem on proportions: Problem type 2
- Word problem involving multiple rates
- Word problem on inverse proportions
- Converting between compound units: Basic
- Converting between compound units: Advanced
- Ordering numbers with positive exponents
- Ordering numbers with negative exponents
- Solving a word problem using an exponential equation: Problem type 1
- Finding the side length of a rectangle given its perimeter or area
- Perimeters and side lengths with variables
- Area and perimeter of a rectangle
- Area of a piecewise rectangular figure
- Area between two rectangles
- Area between two concentric circles
- Rate of filling of a solid
- Finding the value for a new score that will yield a given mean
- Rejecting unreasonable claims based on average statistics
- Making reasonable inferences based on proportion statistics
- Counting principle
- Permutations
- Combinations
- Permutations, combinations, and the multiplication principle for counting
- Die rolling
- Probability of the union of two events

**A1.8.C: Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.**

- Simple word problem on proportions
- Word problem on percentage: Problem type 1
- Word problem on percentage: Problem type 2
- Word problem on percentage: Problem type 3
- Simple interest
- Solving a word problem using a linear equation: Problem type 1
- Solving a word problem using a linear equation: Problem type 2
- Solving a word problem using a linear equation: Problem type 3
- Solving a word problem using a linear equation: Problem type 4
- Word problem with linear inequalities
- Solutions to a linear equation in two variables: Problem type 1
- Solutions to a linear equation in two variables: Problem type 2
A1.8.D: Generalize a solution strategy for a single problem to a class of related problems, and apply a strategy for a class of related problems to solve specific problems.
Solving a word problem using a system of linear equations: Problem type 5
Simplifying a polynomial expression
Multiplying polynomials
Factoring a perfect square
Factoring a quadratic polynomial in two variables
Factoring a product of a quadratic trinomial and a monomial
Factoring a difference of squares
Factoring with repeated use of the difference of squares formula
Factoring a multivariate polynomial by grouping: Problem type 1
Factoring a multivariate polynomial by grouping: Problem type 2
Finding the roots of a quadratic equation with leading coefficient greater than 1
Solving a quadratic equation needing simplification
Solving a quadratic equation using the quadratic formula
Finding the x-intercept(s) and the vertex of a parabola
Restriction on variable in a denominator
Word problem on direct variation
Evaluating expressions with exponents: Problem type 1
Evaluating expressions with exponents: Problem type 2
Exponents and order of operations
Product rule of exponents in a multivariate monomial
Finding the value for a new score that will yield a given mean
Rejecting unreasonable claims based on average statistics
Probability of independent events
Probability of dependent events

A1.8.E: Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.

- Evaluation of a polynomial in one variable
- Distributive property: Basic
- Distributive property: Advanced
- Combining like terms: Basic
- Properties of addition
- Properties of real numbers
- Function tables
- Finding a function rule: Problem type 2
- Domain and range from ordered pairs
- Domain of a square root function
- Vertical line test
- Writing an equation for a function after a vertical translation
- Classifying the graph of a function
- Graphing a line given the x- and y-intercepts
- Graphing a line given its equation in slope-intercept form
- Solutions to a linear equation in two variables: Problem type 1
- Solutions to a linear equation in two variables: Problem type 2
- Y-intercept of a line
- Finding x- and y-intercepts of a line given the equation in standard form
- Slopes of parallel and perpendicular lines: Problem type 1
- Classifying systems of linear equations from graphs
- Combining like terms: Advanced
- Simplifying a polynomial expression
- Degree of a multivariate polynomial
- Completing the square
- Discriminant of a quadratic equation
- Finding the x-intercept(s) and the vertex of a parabola
- How the leading coefficient affects the shape of a parabola
- Word problem on direct variation
- Conversion between metric and customary unit systems
- Converting between compound units: Basic
- Converting between compound units: Advanced
- Writing a positive number without a negative exponent
- Writing a negative number without a negative exponent
- Finding the side length of a rectangle given its perimeter or area
- Area and perimeter of a rectangle
- Area between two rectangles
- Area between two concentric circles
- Rate of filling of a solid
- Indirect measurement
- Interpreting bar graphs
- Interpreting line graphs
- Interpreting the graphs of two functions
- Choosing a graph to fit a narrative
- Computations from circle graphs
- Interpreting circle graphs or pie charts
- Scatterplots and correlation
- Sketching the line of best fit
- Interpreting a stem-and-leaf plot
- Using back-to-back stem-and-leaf plots to compare data sets
- How changing a value affects the mean and median
- Choosing the best measure to describe data
- Rejecting unreasonable claims based on average statistics
- Making reasonable inferences based on proportion statistics
- Permutations
- Combinations
- Odds of an event
- Probability of independent events
- Probability of dependent events


N/A

A1.8.G: Synthesize information to draw conclusions, and evaluate the arguments and conclusions of others.

- Finding a function rule: Problem type 1
- Finding a function rule: Problem type 2
- Arithmetic and geometric sequences: Identifying and writing in standard form
- Choosing a graph to fit a narrative
- Finding if a question can be answered by the data
- Rejecting unreasonable claims based on average statistics
- Making reasonable inferences based on proportion statistics
- Introduction to expectation

A1.8.H: Use inductive reasoning about algebra and the properties of numbers to make conjectures, and use deductive reasoning to prove or disprove conjectures.

N/A