Algebra 1
9-Week Pacing Guide

June 2016

First 9 weeks

Week 1

A-APR.1

Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Week 2

Continue A-APR.1 POLYNOMIALS

A-REI.1

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A-REI.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Week 3

Continue

A-REI.1 AND A-REI.3

A-CED.4

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law* V = IR *to*

highlight resistance R.*

Week 4

F-IF.6

Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*

Week 5

F-IF.1

Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain,

then f(x) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation y = f(x)**.**

F-IF.2

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context

F-IF.3

Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by*

f(0) = f(1) =

1, f(n +1) = f(n)+

f(n -1) ***for*** n 2 : 1**.**

F-IF.5

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function* h(n) ***gives the number of person-hours it takes to assemble*** n ***engines in a factory, then the positive integers would be an appropriate domain for the function.****

Week 6

Continue F-IF.1;2;3;5

FUNCTIONS

Week 7

A-REI.5

Prove that, given a system of two equations in two variables, replacing one equation by the sum of the equation and a multiple of the other produces a system with the same solutions.

A-REI.6

Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

A-REI.10

Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A-REI.11

Explain why the *x*- coordinates of the points where the graphs of the equations y = f(x) and

y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*

Week 8

Spiral review and practice

Week 9

BMA 1

*Each week's skills will be spiraled throughout the nine weeks as appropriate.

Algebra 1
9-Week Pacing Guide

June 2016

Second 9 weeks

Week 1

A-APR.1
Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

A-SSE.2
Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$ *thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$.

A-SSE.3.a
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

a. Factor a quadratic expression to reveal the zeros of the function it defines.

A-SSE.3.b
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

A-SSE.3.c
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Use the properties of exponents to transform expressions for exponential functions.

Week 2

CONTINUE

A-APR.1, **A-SSE.2, A-SSE.3.a, A-SSE.3.b A-SSE.3.c**

Week 3

F-IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.4 (CONTINUED)
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.7.b
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*

a. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F-IF.7.b (CONTINUED)
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*

b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F-IF.8.a
Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

Week 4
CONTINUE
F-IF.4 F-IF.7.b F-IF.8.a

Week 5
CONTINUE
F-IF.4 F-IF.7.b F-IF.8.a

Week 6
CONTINUE
F-IF.4 F-IF.7.b F-IF.8.a

Week 7
CONTINUE
F-IF.4 F-IF.7.b F-IF.8.a

Week 8
Spiral review and practice

Week 9
BMA 2

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Algebra 1
9-Week Pacing Guide

June 2016

Third 9 weeks

Week 1-3

A-REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A-REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

A-CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*

A-CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.**

Week 4

N-RN.3
Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero

Rational numbers and ab irrational numbers is irrational.

Week 5

F-LE.1.a
Distinguish between situations that can be modeled with linear functions and with exponential functions.*

a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors
b. **over equal intervals.**

F-LE.1.a (CONTINUED)
Distinguish between situations that can be modeled with linear functions and with exponential functions.*

a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.

F-LE.1.b
Distinguish between situations that can be modeled with linear functions and with exponential functions.*
Recognize situations in which one quantity changes at a constant rate per unit interval relative to another

F-LE.1.c
Distinguish between situations that can be modeled with linear functions and with exponential functions.*

b. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

F-LE.2
Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).*

F-LE.3
Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. *

F-LE.5
Interpret the parameters in a linear or exponential function in terms of a context.

Week 6

F-LE.1.a; **F-LE.1.b**; **F-LE.1.c**; **F-LE.2**; **F-LE.3**; **F-LE.5**

Week 7

Spiral review and practice

Week 8

Spiral review and practice

Week 9

BMA 3

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Algebra 1
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Fourth 9 weeks

Week 1

S-ID.6.a
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*

a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*

S-ID.6.b
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*

b. Informally assess the fit of a function by plotting and analyzing residuals.

S-ID.6.c
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*

c. Fit a linear function for a scatter plot that suggests a linear association.

S-ID.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*

S-ID.7 continued **Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.***

S-ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.*

S-ID.9
Distinguish between correlation and causation.*

Week 2

F-BF.1
Write a function that describes a relationship between two quantities.*

a. Determine an explicit expression, a recursive process, or steps for calculation from a context.

F-BF.3
Identify the effect on the graph of replacing *f(x)* by *f(x)+k, k f(x), f(kx)*, and *f(x+k)* for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*

F-BF.3 (CONTINUED)
Identify the effect on the graph of replacing *f(x)* by *f(x)+k, k f(x), f(kx)*, and *f(x+k)* for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*

Week 3
review and practice

Week 4
review and practice

Week 5
review and practice

Week 6
review and practice

Week 7
review and practice

Week 8
Spiral review and practice

Week 9

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