Vertical Articulation Technical Assistance Document - Algebra; Algebra, Functions, and Data Analysis; and Algebra 2

	Content from Earlier Grades	Algebra I	Algebra, Functions, Data Analysis	Algebra 2
Expressions	7.1b) determine scientific notation for numbers > zero c) compare/order fract/dec/%, and scientific notation	8.1 a) simplify numerical expressions involving positive exponents, using rational numbers, order of operations, properties; b) compare/order fract/dec/%, and scientific notation	A.1 represent verbal quantitative situations algebraically/evaluate expressions for given replacement values of variables	AII.1 given rational/radical/ poly expressions - a) add/sub/mult/div/simplify rational alg expressions; b) add/sub/mult/div/simplify radical exp containing rational numbers/variables/ expressions containing rational exponents; c) write radical exp as exp containing rational exponents; d) factor polynomials completely
	7.13 a) write verbal expressions as algebraic expressions and sentences as equations and vice versa; b) evaluate algebraic expressions	8.4 evaluate algebraic expressions using order of operations		
Properties and Operations	7.16 apply properties w/ real numbers: a) commutative and associative properties for add/mult; b) distrib property; c) add/mult identity properties; d) add/mult inverse properties; e) mult property of zero	8.15 c) ID properties of operations used to solve equations	A.2 perform operations on polynomials - a) apply laws of exponents to perform ops on expressions; b) add/sub/ mult/div poly; c) factor first-/second-degree binomials/ trinomials (1 or 2 vars)	AII.3 perform operations on complex numbers/express results in simplest form using patterns of the powers of i/ID field properties for complex numbers
Square/Cube Roots	7.1 d) determine square roots	8.5 a) determine if a number is a perfect square; b) find two consecutive whole numbers between which a square root lies	A.3 express sq roots/cube roots of whole numbers/the square root of monomial alg exp (simplest radical form)	
Sequences	7.2 describe/represent arithmetic/geometric sequences using variable expressions			AII.2 investigate/apply properties of arithmetic/ geometric sequences/series to solve real-world problems, including writing the first n terms/finding nth term/ evaluating summation formulas

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Solving and Graphing Equations and Inequalities	7.14 a) solve one- and two-step linear equations; b) solve practical problems in one variable	8.15 a) solve multistep linear equations in one variable (variable on one and two sides of equations); c) ID properties of operations used to solve	A.4 solve multistep linear/ quad equation (2 vars) - a) solve literal equation; b) justify steps used in simplifying expresessions and solving equations; c) solve quad equations (alg/graph); d) solve multistep linear equations (alg/graph); e) solve systems of two linear equation (2 vars - alg/graph); f) solve real-world problems involving equations and systems of equations		AII.4 solve (alg/graph) a) abs value equation/inequ; b) quad equation over complex; c) equation containing rational algebraic expression; d) equation containing radical exp
	7.15 a) solve one-step inequalities; b) graph solutions on number line	8.15 b) solve two-step linear inequalities and graph results on number line; c) ID properties of operations used to solve	A.5 solve multistep linear inequ (2 vars) - a) solve multistep linear inequal (alg/graph); b) justify steps used in solving inequal; c) solve real-world problems involving inequal; d) solve systems of inequal	AFDA.5 determine opt values in problem situations by identifying constraints/using linear progrogramming techniques	AII.5 solve nonlinear systems (alg/graph)
	7.15 a) solve one-step inequalities; b) graph solutions on number line	8.15 b) solve two-step linear inequalities and graph results on number line; c) ID properties of operations used to solve	A.6 graph linear equations/linear inequal (2 vars) - a) determine slope of line given equation of line/ graph of line or two points on line - slope as rate of change; b) write equation of line given graph of line/two points on line or slope-point on line	AFDA.2 use transformations to write equations, given graph of function (linear/quad/exp/log)	AII.6 recognize general shape of function (abs val/sq root/ cube root/rational/poly/exp/ log) families/convert between graphic and symbolic forms of functions - transformational approach to graphing
		8.16 graph linear equations in two variables			

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Function Analysis		8.17 ID domain, range, indep/dep variable	A.7 investigate/analyze function (linear/quad) families and characteristics (alg/graph) - a) determine relation is function?; b) domain/range; c) zeros; d) x- and y-intercepts; e) find values of funct for elements in domain; f) make connect between/among mult repres of funct (concrete/verbal/ numeric/graphic/algebraic)	AFDA.1 investigate/analyze function (linear/quad/exp/log) families/characteristics - a) continuity; b) local/abs max/min; c) domain/range; d) zeros; e) intercepts; f) intervals inc/dec; g) end behaviors; h) asymptotes	AII.7 investigate/analyze functions (alg/graph) a) domain/range; b) zeros; c) x- and y-intercepts; d) intervals inc/dec; e) asymptotes; f) end behavior; g) inverse of a function; h) composition of multiple functions
	7.12 represent relationships with tables, graphs, rules, and words	8.14 make connections between any two representations (tables, graphs, words, rules)		AFDA.4 transfer between/analyze mult representations of functions (alg formulas/graphs/tables/ words)	
Data Analysis	7.11 a) construct/analyze histograms; b) compare/contrast histograms		A.10 compare/contrast mult univ data sets with box-and-whisker plots		
		8.13 a) make comparisons/predictions/inferences, using information displayed in graphs; b) construct/analyze scatterplots	A.11 collect/analyze data/determine equation of curve best fit to make predictions/solve real-world problems, using models (linear/quad)	AFDA.3 collect data/generate equ for curve (linear/quad/ exp/log) of best fit/use best fit equ to interpolate function values/make decisions/justify conclusions (alg/graph models)	AII.9 collect/analyze data/ determine equ of the curve of best fit/make predictions/ solve real-world problems, using models (poly/exp/log)
Measures of Data Spread	5.16 a) describe mean/median/mode; b) describe mean as fair share; c) find the mean/median/mode/range; d) describe range as measure of variation	6.15 a) describe mean as balance point; b) decide which measure of center is appropriate	A.9 given a set of data, interpret variation in real-world contexts/calculate/interpret mean absolute deviation/stand dev/z-scores	AFDA.7 analyze norm distrib - a) characteristics of normally distrib data; b) percentiles; c) normalizing data, using z-scores; d) area under std norm curve/probability	AII.11 ID properties of norm distrib/apply properties to determine probabilities associated with areas under the standard normal curve
Variation			A.8 given real-world context, analyze relation to determine direct/inverse variation/represent direct variation (alg/graph)/inverse variation (alg)		AII.10 ID/create/solve real-world problems involving inverse/joint variation/combo of direct/inverse variations
Experimental Design				AFDA.8 design/conduct exper/survey - a) sample size; b) sampling technique; c) control sources of bias/ exp error; d) data collection; e) data analysis/reporting	

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Probability/ Permutation/ Combination	7.9 investigate/describe the difference between the experimental/theoretical probability	8.12 determine probability of indep/dep events with and without replacement		AFDA.6 calculate probabilities - a) conditional prob; b) dep/indep events; c) add/mult rules; d) counting techniques (permutations/combinations); Law of Large Numbers	AII.12 compute/distinguish between permutation/combination and apply
	7.10 determine the probability of compound events, Basic Counting Principle				