Appendix D. KSA Exclusions

Findings presented for both mathematics and reading content areas across all occupational areas (CSS, HVAC, LPN, PT Introductory, PT Concluding, and AMT)

NOTES:

The number indicates how many instancesacross all reviewed packets that the reviewer excluded text in column E. For example Reviewer 1 in CSS excluded literary texts in eleven courses out of the total courses reviewed. An exclusion had to be noted three or more times to be noted in the spreadsheet.

NAEP Framework					CSS			HVAC			LPN				PT-Introductory				PT-Concluding			
Cognitive Domain	**Standard**	**Text**	**KSA ID**	**Exclusion**	**Reviewer 1**	**Reviewer 2**	**Reviewer 3**	**Reviewer 1**	**Reviewer 2**	**Reviewer 3**	**Reviewer 1**	**Reviewer 2**	**Reviewer 3**	**Reviewer 4**	**Reviewer 1**	**Reviewer 2**	**Reviewer 3**	**Reviewer 4**	**Reviewer 1**	**Reviewer 2**	**Reviewer 3**	**Reviewer 4**
Locate/Recall: Locate or recall textually explicit information within and across texts, which may involve making simple inferences as needed for literal comprehension	**Standard**	Locate or recall textually explicit information and make simple inferences within and across both literary and informational texts.	1-1	literary texts	11	11	11	11	12	13	10	9	9		11		11		12	12		
	Objective	Locate or recall specific information such as definitions, facts, and supporting details in text or graphics.	1-1-a	text		1				1					6				8			
	Standard	Locate or recall textually explicit information and make simple inferences within and across literary texts.	1-2	literary texts				12			2											
	Objective	Locate or recall character traits.	1-2-a																			
	Objective	Locate or recall sequence of events or actions.	1-2-b																			
	Objective	Locate or recall setting.	1-2-c																			
	Objective	Locate or recall figurative language.	1-2-d																			
	Objective	Locate or recall organizing structures of literary texts, such as verse or stanza in poetry or description, chronology, comparison, etc. in literary non-fiction.	1-2-e	literary texts, poetry	11			12					3									
	Standard	Locate or recall textually explicit information and make simple inferences within and across informational texts.	1-3	across		1						1			4				4			
	Objective	Locate or recall the topic sentence or main idea.	1-3-a	topic sentence	11		1	10											12			
	Objective	Locate or recall the author's purpose.	1-3-b																			
	Objective	Locate or recall causal relations.	1-3-c																			
	Objective	Locate or recall organizing structures of texts, such as comparison/contrast, problem/solution, enumeration, etc.	1-3-d	recall, enumerations								1	2									
Integrate/Interpret: Make complex inferences within and across texts	**Standard**	Make complex inferences within and across both literary and informational texts.	2-1	literary texts	11	5	3	11	4	2	10	10	7			2	11		12	11		
	Objective	Describe problem and solution, or cause and effect.	2-1-a	problem and solution		2						1										
	Objective	Compare or connect ideas, perspectives, problems or situations.	2-1-b																			
	Objective	Determine unstated assumptions in an argument.	2-1-c																			
	Objective	Describe or analyze how an author uses literary devices or text features to convey meaning.	2-1-d	devices	11			11														
	Objective	Describe or analyze how an author uses organizing structures to convey meaning.	2-1-e	analyze																		
	Objective	Describe or analyze author's purpose.	2-1-f	analyze																		
	Standard	Make complex inferences within and across literary texts.	2-2	literary texts				6														
	Objective	Interpret mood, tone, or voice.	2-2-a																			
	Objective	Integrate ideas to determine theme.	2-2-b																			
	Objective	Interpret a character's conflicts, motivations, and decisions.	2-2-c																			
	Objective	Examine relations between or among theme, setting, plot, or characters.	2-2-d																			
	Objective	Explain how rhythm, rhyme, sound, or form in poetry contribute to meaning.	2-2-e																			
	Standard	Make complex inferences within and across informational texts.	2-3	across																		
	Objective	Summarize major ideas.	2-3-a																11			
	Objective	Draw conclusions and provide supporting information.	2-3-b	provide supporting information								7										
	Objective	Find evidence in support of an argument.	2-3-c	in support																		
	Objective	Distinguish facts from opinions.	2-3-d																			
	Objective	Determine the importance of information within and across texts.	2-3-e	and across															5			
	Standard	Apply understanding of vocabulary to comprehension of both literary and informational texts.	2-4	literary texts	8	10	6	9	10	3	7	10	3		10		1		12	1		
	Objective	Determine word meaning as used in context.	2-4-a			2													1			
Critique/Evaluate: Consider text(s) critically	**Standard**	Consider both literary and informational texts critically.	3-1	literary texts	11		3	11					2				3		12	4		
	Objective	Judge the author's craft and technique.	3-1-a																			
	Objective	Analyze, critique, or evaluate the author's perspective or point of view.	3-1-b	perspective or point of view	10			11														
	Objective	Take different perspectives in relation to a text.	3-1-c																			
	Standard	Consider literary texts critically.	3-2																			
	Objective	Evaluate the role of literary devices in conveying meaning.	3-2-a	literary devices				4														
	Objective	Determine the degree to which literary devices enhance a literary work.	3-2-b																			
	Objective	Evaluate a character's conflict, motivations, and decisions.	3-2-c																			
	Standard	Consider informational text critically.	3-3																			
	Objective	Evaluate the way the author selects language to influence readers.	3-3-a																			
	Objective	Evaluate the strength and quality of evidence used by the author to support his or her position.	3-3-b																			
	Objective	Determine the quality of counterarguments within and across texts.	3-3-c																			
	Objective	Judge the coherence or logic of an argument.	3-3-d																			

NOTES:

The number indicates how many instances across all reviewed packets that the reviewer excluded text in column E. For example, Reviewer 1 in CSS excluded exponents and logarithms in one course out of the total courses reviewed. An exclusion had to be noted three or more times to be noted in the spreadsheet.

NAEP Framework					CSS			HVAC			LPN				PT-Introductory				PT-Concluding			
Domain	Standard	Objective	KSA ID	Exclusion	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4
Number properties and operations	Number sense	Represent, interpret, or compare expressions for real numbers, including expressions using exponents and logarithms.	1-1-d	exponents and logarithms	1	8	6		14			9	7	8	16	9	16	2	15	2	12	
		Represent or interpret expressions involving very large or very small numbers in scientific notation.	1-1-f			1																
		Represent, interpret, or compare expressions or problem situations involving absolute values.	1-1-g	problem situations involving absolute value									5	5			14				8	
		Order or compare real numbers, including very large and very small real numbers.	1-1-i	very large and very small real numbers		1	1			17				1			8					
	Estimation	Identify situations where estimation is appropriate, determine the needed degree of accuracy, and analyze the effect of the estimation method on the accuracy of results.	1-2-b	identify situations, analyze the effect of the estimation method								1			2		1		5			
		Verify solutions or determine the reasonableness of results in a variety of situations.	1-2-c																			
		Estimate square or cube roots of numbers less than 1,000 between two whole numbers.	1-2-d																			
	Number operations	Find integral or simple fractional powers of real numbers.	1-3-a	fractional powers		3	2		4					4			2					
		Perform arithmetic operations with real numbers, including common irrational numbers.	1-3-b	irrational numbers		7	6		15	13		8	5	6	15	15	17		15	8	9	
		Perform arithmetic operations with expressions involving absolute value.	1-3-c	absolute value						1			6	6	5		13		1		10	
		Describe the effect of multiplying and dividing by numbers including the effect of multiplying or dividing a real number by zero, or a number less than zero, or a number between zero and one, or one, or a number greater than one.	1-3-d		1									7								
		Solve application problems involving numbers, including rational and common irrationals.	1-3-f	rational and common irrationals	1	7	1		15	13		7	5	5	16	17	15		15	11	11	
	Ratios and proportional reasoning	Use proportions to solve problems (including rates of change).	1-4-c	rates of change								3	3		4		4					
		Solve multistep problems involving percentages, including compound percentages.	1-4-d	multistep problems, percentages			1	10	2	na, 5			3	2	na, 13	15	12			12	6	
	Properties of number and operations	Solve problems using factors, multiples, or prime factorization.	1-5-c	multiples, prime factorization									4				4, 9					
		Use divisibility or remainders in problem settings.	1-5-d						1					4								
		Apply basic properties of operations, including conventions about the order of operations.	1-5-e	conventions about the order of operations									5	2	4		13				10	
		Recognize properties of the number system (whole numbers, integers, rational numbers, real numbers, and complex numbers) and how they are related to each other, and identify examples of each type of number.	1-5-f	complex numbers		1			2				8	1	7		15		1		2	
	Mathematical reasoning using number	Give a mathematical argument to establish the validity of a simple numerical property or relationship.	1-6-a																			
		Analyze or interpret a proof by mathematical induction of a simple numerical relationship.	1-6-b																			
Measurement	Measuring physical attributes	Determine the effect of proportions and scaling on length, area, and volume.	2-1-b	1. length 2. area 3. volume									4, 2, na		2, 2, 2		6, 6, 3					
		Estimate or compare perimeters or areas of two-dimensional geometric figures.	2-1-c																			
		Solve problems of angle measure, including those involving triangles or other polygons or parallel lines cut by a transversal.	2-1-d	parallel lines cut by a transversal		1			1	1												
		Solve problems involving perimeter or area of plane figures such as polygons, circles, or composite figures.	2-1-f																			
		Solve problems by determining, estimating, or comparing volumes or surface areas of three-dimensional figures.	2-1-h																			
		Solve problems involving rates such as speed, density, population density, or flow rates.	2-1-i	1. speed 2. density 3. population density											5, 5, 5	10, 10, 10	2, 2, 2					
	Systems of measurement	Recognize that geometric measurements (length, area, perimeter, and volume) depend on the choice of a unit, and apply such units in expressions, equations, and problem solutions.	2-2-a	1. geometric measurements 2. length 3. area 4. perimeter		na, na, 1, na				6, na, na, na							3, 3, 3, 3				1, 1, 1, 1	
		Solve problems involving conversions within or between measurement systems, given the relationship between the units.	2-2-b																			
		Understand that numerical values associated with measurements of physical quantities are approximate, are subject to variation, and must be assigned units of measurement.	2-2-d	approximate, are subject to variation						3		5			3				13			
		Determine appropriate accuracy of measurement in problem situations (e.g., the accuracy of measurement of the dimensions to obtain a specified accuracy of area) and find the measure to that degree of accuracy.	2-2-e																			
		Construct or solve problems involving scale drawings.	2-2-f																			
		Solve problems involving indirect measurement.	2-3-a																			
		Solve problems using the fact that trigonometric ratios (sine, cosine, and tangent) stay constant in similar triangles.	2-3-b																			
		Use the definitions of sine, cosine, and tangent as ratios of sides in a right triangle to solve problems about length of sides and measure of angles.	2-3-c																			

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NAEP Framework					CSS			HVAC			LPN				PT-Introductory				PT-Concluding			
	Measurement in triangles	Interpret and use the identity $\sin^2\theta + \cos^2\theta = 1$ for angles θ between 0° and 90°; recognize this identity as a special representation of the Pythagorean theorem.	2-3-d																			
		Determine the radian measure of an angle and explain how radian measurement is related to a circle of radius 1.	2-3-e																			
		Use trigonometric formulas such as addition and double angle formulas.	2-3-f																			
		Use the law of cosines and the law of sines to find unknown sides and angles of a triangle.	2-3-g																			
Geometry	Dimension and shape	Give precise mathematical descriptions or definitions of geometric shapes in the plane and in three-dimensional space.	3-1-c																			
		Draw or sketch from a written description plane figures and planar images of three-dimensional figures.	3-1-d																			
		Use two-dimensional representations of three-dimensional objects to visualize and solve problems.	3-1-e																			
		Analyze properties of three-dimensional figures including spheres and hemispheres.	3-1-f																			
	Transformation of shapes and preservation of properties	Recognize or identify types of symmetries (e.g., point, line, rotational, self-congruence) of two- and three-dimensional figures.	3-2-a																			
		Give or recognize the precise mathematical relationship (e.g., congruence, similarity, orientation) between a figure and its image under a transformation.	3-2-b																			
		Perform or describe the effect of a single transformation on two- and three-dimensional geometric shapes (reflections across lines of symmetry, rotations, translations, and dilations).	3-2-c																			
		Identify transformations, combinations, or subdivisions of shapes that preserve the area of two-dimensional figures or the volume of three-dimensional figures.	3-2-d																			
		Justify relationships of congruence and similarity and apply these relationships using scaling and proportional reasoning.	3-2-e																			
		Perform or describe the effects of successive transformations.	3-2-g																			
	Relationships between geometric figures	Apply geometric properties and relationships to solve problems in two and three dimensions.	3-3-b	three dimensions		1					1		1		1	1	1					
		Represent problem situations with geometric models to solve mathematical or real-world problems.	3-3-c																			
		Use the Pythagorean theorem to solve problems in two- or three-dimensional situations.	3-3-d																			
		Recall and interpret definitions and basic properties of congruent and similar triangles, circles, quadrilaterals, polygons, parallel, perpendicular and intersecting lines, and associated angle relationships.	3-3-e	lines							1			1	1							
		Analyze properties or relationships of triangles, quadrilaterals, and other polygonal plane figures.	3-3-f																			
		Analyze properties and relationships of parallel, perpendicular, or intersecting lines including the angle relationships that arise in these cases.	3-3-g																			
		Analyze properties of circles and the intersections of lines and circles (inscribed angles, central angles, tangents, secants, and chords).	3-3-h																			
	Position, direction, and coordinate geometry	Solve problems involving the coordinate plane such as the distance between two points, the midpoint of a segment, or slopes of perpendicular or parallel lines.	3-4-a																			
		Describe the intersections of lines in the plane and in space, intersections of a line and a plane, or of two planes in space.	3-4-b																			
		Describe or identify conic sections and other cross sections of solids.	3-4-c																			
		Represent two-dimensional figures algebraically using coordinates and/or equations.	3-4-d																			
		Use vectors to represent velocity and direction; multiply a vector by a scalar and add vectors both algebraically and graphically.	3-4-e																			
		Find an equation of a circle given its center and radius and, given an equation of a circle, find its center and radius.	3-4-f																			
		Graph ellipses and hyperbolas whose axes are parallel to the coordinate axes and demonstrate understanding of the relationship between their standard algebraic form and their graphical characteristics.	3-4-g																			
		Represent situations and solve problems involving polar coordinates.	3-4-h																			
	Mathematical reasoning in geometry	Make, test, and validate geometric conjectures using a variety of methods including deductive reasoning and counter examples.	3-5-a																			
		Determine the role of hypotheses, logical implications, and conclusion in proofs of geometric theorems.	3-5-b																			
		Analyze or explain a geometric argument by contradiction.	3-5-c																			
		Analyze or explain a geometric proof of the Pythagorean theorem.	3-5-d																			
		Prove basic theorems about congruent and similar triangles and circles.	3-5-e																			
		Read or interpret graphical or tabular representations of data.	4-1-a	graphical												2	1					

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NAEP Framework					CSS			HVAC			LPN				PT-Introductory				PT-Concluding			
Data analysis, statistics, and probability	Data representation	For a given set of data, complete a graph and solve a problem using the data in the graph (histograms, scatterplots, and line graphs).	4-1-b																			
		Solve problems involving univariate or bivariate data.	4-1-c	bivariate data					5													
		Given a graphical or tabular representation of a set of data, determine whether information is represented effectively and appropriately.	4-1-d																			
		Compare and contrast different graphical representations of univariate and bivariate data.	4-1-e																			
		Organize and display data in a spreadsheet in order to recognize patterns and solve problems.	4-1-f	display data in a spreadsheet			4															
	Characteristics of data sets	Calculate, interpret, or use summary statistics for distributions of data including measures of typical value (mean, median), position (quartiles, percentiles), and spread (range, interquartile range, variance, and standard deviation).	4-2-a																			
		Recognize how linear transformations of one-variable data affect mean, median, mode, range, interquartile range, and standard deviation.	4-2-b																			
		Determine the effect of outliers on mean, median, mode, range, interquartile range, or standard deviation.	4-2-c																			
		Compare data sets using summary statistics (mean, median, mode, range, interquartile range, or standard deviation) describing the same characteristic for two different populations or subsets of the same population.	4-2-d																			
		Approximate a trend line if a linear pattern is apparent in a scatterplot or use a graphing calculator to determine a least squares regression line and use the line or equation to make predictions.	4-2-e																			
		Recognize that the correlation coefficient is a number from -1 to +1 that measures the strength of the linear relationship between two variables; visually estimate the correlation coefficient (e.g., positive or negative, closer to 0, .5, or 1.0) of a scatterplot.	4-2-f																			
		Know and interpret the key characteristics of a normal distribution such as shape, center (mean), and spread (standard deviation).	4-2-g																			
	Experiments and samples	Identify possible sources of bias in sample surveys and describe how such bias can be controlled and reduced.	4-3-a																			
		Recognize and describe a method to select a simple random sample.	4-3-b																			
		Draw inferences from samples, such as estimates of proportions in a population, estimates of population means, or decisions about differences in means for two "treatments."	4-3-c																			
		Identify or evaluate the characteristics of a good survey or of a well-designed experiment.	4-3-d																			
		Recognize the differences in design and in conclusions between randomized experiments and observational studies.	4-3-e																			
	Probability	Recognize whether two events are independent or dependent.	4-4-a																			
		Determine the theoretical probability of simple and compound events in familiar or unfamiliar contexts.	4-4-b																			
		Given the results of an experiment or simulation, estimate the probability of simple or compound events in familiar or unfamiliar contexts.	4-4-c																			
		Use theoretical probability to evaluate or predict experimental outcomes.	4-4-d																			
		Determine the number of ways an event can occur using tree diagrams, formulas for combinations and permutations, or other counting techniques.	4-4-e																			
		Determine the probability of independent and dependent events.	4-4-h																			
		Determine conditional probability using two-way tables.	4-4-i																			
		Interpret and apply probability concepts to practical situations.	4-4-j																			
		Use the binomial theorem to solve problems.	4-4-k																			
	Mathematical reasoning with data	Identify misleading uses of data in real-world settings and critique different ways of presenting and using information.	4-5-a																			
		Distinguish relevant from irrelevant information, identify missing information, and either find what is needed or make appropriate approximations.	4-5-b	reasoning not related to mathematical issues			3	8														
		Recognize, use, and distinguish between the processes of mathematical (deterministic) and statistical modeling.	4-5-c																			
		Recognize when arguments based on data confuse correlation with causation.	4-5-d																			
		Recognize and explain the potential errors caused by extrapolating from data.	4-5-e																			
	Patterns	Recognize, describe, or extend numerical patterns, including arithmetic and geometric progressions.	5-1-a																			
		Express linear and exponential functions in recursive and explicit form given a table, verbal description, or some terms of a sequence.	5-1-b	exponential functions		2						1										
		Identify or analyze distinguishing properties of linear, quadratic, rational, exponential, or *trigonometric functions from tables, graphs, or equations.	5-1-e	trigonometric									1		1	1	2					
		Determine whether a relation, given in verbal, symbolic, tabular, or graphical form, is a function.	5-1-g																			

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Algebra	relations, and functions	Recognize and analyze the general forms of linear, quadratic, rational, exponential, or *trigonometric functions.	5-1-h	1. quadratic functions 2. rational functions 3. exponential functions 4. trigonometric functions									1, 1, 1, 1			2, 2, 2, 2						
		Determine the domain and range of functions given in various forms and contexts.	5-1-i																			
		Given a function, determine its inverse if it exists and explain the contextual meaning of the inverse for a given situation.	5-1-j																			
	Algebraic representations	Create and translate between different representations of algebraic expressions, equations, and inequalities (e.g., linear, quadratic, exponential, or trigonometric) using symbols, graphs, tables, diagrams, or written descriptions.	5-2-a	1. inequalities 2. quadratic 3. exponential 4. trigonometric		1, 1, 1, 1							1, 1, 1, 1		1, 1, 1, 1	1, 1, 1, 1						
		Analyze or interpret relationships expressed in symbols, graphs, tables, diagrams (including Venn diagrams), or written descriptions and evaluate the relative advantages or disadvantages of different representations to answer specific questions.	5-2-b	evaluate the relative advantages and disadvantages							13	8			13	1			14			
		Perform or interpret transformations on the graphs of linear, quadratic, exponential, and *trigonometric functions.	5-2-d																			
		Make inferences or predictions using an algebraic model of a situation.	5-2-e																			
		Given a real-world situation, determine if a linear, quadratic, rational, exponential, logarithmic, or *trigonometric function fits the situation.	5-2-f																			
		Solve problems involving exponential growth and decay.	5-2-g																			
		Analyze properties of exponential, logarithmic, and rational functions.	5-2-h																			
	Variables, expressions, and operations	Write algebraic expressions, equations, or inequalities to represent a situation.	5-3-b	inequalities		2			5	5												
		Perform basic operations, using appropriate tools, on algebraic expressions including polynomial and rational expressions.	5-3-c	polynomial		3				1					1							
		Write equivalent forms of algebraic expressions, equations, or inequalities to represent and explain mathematical relationships.	5-3-d	inequalities		1									1							
		Evaluate algebraic expressions including polynomials and rational expressions.	5-3-e	polynomials		2			6	6					1							
		Use function notation to evaluate a function at a specified point in its domain and combine functions by addition, subtraction, multiplication, division, and composition.	5-3-f																			
		Determine the sum of finite and infinite arithmetic and geometric series.	5-3-g																			
		Use basic properties of exponents and *logarithms to solve problems.	5-3-h	logarithms								2	2			3	1					
	Equations and inequalities	Solve linear, rational, or quadratic equations or inequalities, including those involving absolute value.	5-4-a	1. quadratic equations 2. inequalities 3. including those involving absolute value		2, 2, 2		2, na, 4		7, 7, 7		na, na, 8	1		14	1	1, na, 1		15			
		Analyze situations, develop mathematical models, or solve problems using linear, quadratic, exponential, or logarithmic equations or inequalities symbolically or graphically.	5-4-c	1. quadratic 2. exponential 3. logarithmic 4. inequalities		2				7, 7, 7, 7			1, 1, 1, 1		na, na, 1, na	2						
		Solve (symbolically or graphically) a system of equations or inequalities and recognize the relationship between the analytical solution and graphical solution.	5-4-d	1. inequalities 2. recognize the relationship 3. graphical						7, 7, 7					1							
		Solve problems involving special formulas such as A = P(I + r)t, A = Pert.	5-4-e																			
		Solve an equation or formula involving several variables for one variable in terms of the others.	5-4-f																			
		Solve quadratic equations with complex roots.	5-4-g																			
	Mathematical reasoning in algebra	Use algebraic properties to develop a valid mathematical argument.	5-5-a																			
		Determine the role of hypotheses, logical implications, and conclusions in algebraic argument.	5-5-b																			
		Explain the use of relational conjunctions (and, or) in algebraic arguments.	5-5-c																			