Introduction to the
Revised Mathematics TEKS

SIDE-BY-SIDE TEKS COMPARISON ADVANCED QUANTITATIVE REASONING

TEA
Texas Education Agency

Advanced Quantitative Reasoning – Mathematics

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
(a) General requirements. Students shall be awarded one credit for successful completion of this course. Prerequisite: Algebra II.	(a) General requirements. Students shall be awarded one-half to one credit for successful completion of this course. Prerequisites: Geometry and Algebra II.	The Revised TEKS (2012) include descriptions of prerequisite coursework.	
	(b) Introduction. (1) The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on fluency and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.	A well balanced mathematics curriculum includes the college and career readiness standards. A focus on mathematical fluency and solid understanding allows for rich exploration of the key ideas of Advanced Quantitative Reasoning.	
(b) Introduction. (1) In Advanced Quantitative Reasoning, students continue to build upon the K-8, Algebra I, Algebra II, and Geometry foundations as they expand their understanding through further mathematical experiences. Advanced Quantitative Reasoning includes the analysis of information using statistical methods and probability, modeling change and mathematical relationships, and spatial and geometric modeling for mathematical reasoning. Students learn to become critical consumers of real-world quantitative data, knowledgeable problem solvers who use logical reasoning, and mathematical thinkers who can use their quantitative skills to solve authentic problems. Students develop critical skills for success in college and careers, including investigation, research, collaboration, and both written and oral communication of their work, as they solve problems in many types of applied situations.	(b) Introduction. (3) In Advanced Quantitative Reasoning, students will develop and apply skills necessary for college, careers, and life. Course content consists primarily of applications of high school mathematics concepts to prepare students to become well-educated and highly informed 21st century citizens. Students will develop and apply reasoning, planning, and communication to make decisions and solve problems in applied situations involving numerical reasoning, probability, statistical analysis, finance, mathematical selection, and modeling with algebra, geometry, trigonometry, and discrete mathematics.	The Revised TEKS (2012) condense the language of the basic understandings.	

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(b) Introduction. (2) As students work with these mathematical topics, they continually rely on mathematical processes, including problem-solving techniques, appropriate mathematical language and communication skills, connections within and outside mathematics, and reasoning. Students also use multiple representations, technology, applications and modeling, and numerical fluency in problem-solving contexts.	(b) Introduction. (2) The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, and number sense to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication. (4) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.	This highlights the emphasis of students' use of the mathematical process standards to acquire and demonstrate mathematical understanding.	

Advanced Quantitative Reasoning – Mathematics

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●	AQR(1)(A) The student develops and applies skills used in college and careers, including reasoning, planning, and communication, to make decisions and solve problems in applied situations involving numerical reasoning, probability, statistical analysis, finance, mathematical selection, and modeling with algebra, geometry, trigonometry, and discrete mathematics. **The student is expected to gather data, conduct investigations, and apply mathematical concepts and models to solve problems in mathematics and other disciplines.**	AQR(1)(A) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to apply mathematics to problems arising in everyday life, society, and the workplace.**	The revised SE has been placed into the mathematical process standards strand. When AQR(1)(A) is paired with a revised content SE, students may be expected to gather data, conduct investigations, and apply mathematical concepts and models as they solve problems.	
●	AQR(1)(B) The student develops and applies skills used in college and careers, including reasoning, planning, and communication, to make decisions and solve problems in applied situations involving numerical reasoning, probability, statistical analysis, finance, mathematical selection, and modeling with algebra, geometry, trigonometry, and discrete mathematics. **The student is expected to demonstrate reasoning skills in developing, explaining, and justifying sound mathematical arguments, and analyze the soundness of mathematical arguments of others.**	AQR(1)(G) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.**	The revised SE has been placed into the mathematical process standards strand. Specificity has been provided with the inclusion of precise mathematical language. Students may be expected to explain and justify their mathematical ideas and arguments, as well as those of their peers.	
●	AQR(1)(C) The student develops and applies skills used in college and careers, including reasoning, planning, and communication, to make decisions and solve problems in applied situations involving numerical reasoning, probability, statistical analysis, finance, mathematical selection, and modeling with algebra, geometry, trigonometry, and discrete mathematics. **The student is expected to communicate with mathematics orally and in writing as part of independent and collaborative work, including making accurate and clear presentations of solutions to problems.**	AQR(1)(F) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to analyze mathematical relationships to connect and communicate mathematical ideas.**	The revised SE has been placed into the mathematical process standards strand. Students are expected to analyze relationships and to form connections with mathematical ideas. Students may form conjectures about mathematical representations based on patterns or sets of examples and non-examples. Forming connections with mathematical ideas extends past conjecturing to include verification through a deductive process.	

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+	AQR(1)(B) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.**	This process standard provides continuity through application of the same problem-solving model included in the TEKS for kindergarten through grade 8 and high school courses.	
+	AQR (1)(C) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.**	The phrase "as appropriate" indicates that students are assessing which tool and techniques to apply rather than trying only one or all of those listed.	
+	AQR(1)(D) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.**	Student communication is expected to address three areas: mathematical ideas, reasoning, and implications of these ideas and reasoning. Communication can be through the use of symbols, diagrams, graphs, or language. The phrase "as appropriate" implies that students are assessing which communication tool to apply rather than trying only one or all of those listed. The use of multiple representations includes translating and making connections among the representations.	
+	AQR(1)(E) **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. **The student is expected to create and use representations to organize, record, and communicate mathematical ideas.**	Students are expected to use representations for three purposes: to organize, record, and communicate mathematical ideas. Representations include verbal, graphical, tabular, and algebraic representations as well as diagrams. As students create and use representations, they will evaluate the effectiveness of their representations to ensure that they are communicating mathematical ideas with clarity. Students may also be expected to evaluate the effectiveness of other people's representations.	

Advanced Quantitative Reasoning – Mathematics

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●	AQR(2)(A) The student analyzes real-world numerical data using a variety of quantitative measures and numerical processes. **The student is expected to apply, compare, and contrast ratios, rates, ratings, averages, weighted averages, or indices to make informed decisions.**	AQR(2)(B) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to apply and analyze published ratings, weighted averages, and indices to make informed decisions.**	The revised SE has been placed into the numeric reasoning strand. Students may be expected to compare and contrast attributes of data accuracy and mathematical applications of data to analyze published ratings. Published ratings may include ratios, rates, and averages.	
●	AQR(2)(B) The student analyzes real-world numerical data using a variety of quantitative measures and numerical processes. **The student is expected to solve problems involving large quantities that are not easily measured.**	AQR(2)(C) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to solve problems involving quantities that are not easily measured using proportionality.**	The revised SE has been placed into the numeric reasoning strand. Problems involving quantities that are not easily measured may include large or small quantities. Specificity has been added to use proportionality to solve the problems.	
●	AQR(2)(C) The student analyzes real-world numerical data using a variety of quantitative measures and numerical processes. **The student is expected to use arrays to efficiently manage large collections of data and add, subtract, and multiply matrices to solve applied problems.**	AQR(2)(F) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to use arrays to efficiently manage large collections of data and add, subtract, and multiply matrices to solve applied problems, including geometric transformations.**	The revised SE has been placed into the numeric reasoning strand. Specificity has been added to include problems involving geometric transformations.	
—	AQR(2)(D) The student analyzes real-world numerical data using a variety of quantitative measures and numerical processes. **The student is expected to apply algorithms and identify errors in recording and transmitting identification numbers.**		This skill is not included within the Revised Mathematics TEKS (2012).	

Advanced Quantitative Reasoning – Mathematics

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+	AQR(2)(A) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to use precision and accuracy in real-life situations related to measurement and significant figures.**		
+	AQR(2)(E) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to solve problems involving large quantities using combinatorics.**	The revised SE builds on combinatorics introduced in Geometry in G(13)(A).	

	Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●+	AQR(3)(A) The student analyzes and evaluates risk and return in the context of real-world problems. **The student is expected to determine and interpret conditional probabilities and probabilities of compound events by constructing and analyzing representations, including tree diagrams, Venn diagrams, and area models, to make decisions in problem situations.**	AQR(4)(C) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to calculate conditional probabilities and probabilities of compound events using tree diagrams, Venn diagrams, area models,**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been added with the rephrasing of "determine" as "calculate." The current SE has been separated into three revised SEs.	
		and formulas.	The use of formulas to calculate conditional probabilities and probabilities of compound events has been added.	
		AQR(4)(D) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to interpret conditional probabilities and probabilities of compound events by analyzing representations to make decisions in problem situations.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. The current SE has been separated into three revised SEs.	

	Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●+	*(continued)* AQR(3)(A) The student analyzes and evaluates risk and return in the context of real-world problems. **The student is expected to determine and interpret conditional probabilities and probabilities of compound events by constructing and analyzing representations, including tree diagrams, Venn diagrams, and area models, to make decisions in problem situations.**	AQR(4)(A) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to use a two-way frequency table as a sample space to identify whether two events are independent and to interpret the results.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Students may be expected to analyze the relationship between two events using a two-way frequency table as part of determining probabilities of compound events that may reflect conditional probabilities. A two-way frequency table, such as the one shown below, may be used to compare probabilities where voters were polled as to how they might vote on a bill related to fines for speeding tickets and whether they had received a speeding ticket. <table><tr><td></td><td>Vote: Yes</td><td>Vote: No</td><td>Undecided</td><td>Total</td></tr><tr><td>Has received a ticket</td><td></td><td></td><td></td><td></td></tr><tr><td>Has not received a ticket</td><td></td><td></td><td></td><td></td></tr><tr><td>Unwilling to disclose</td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td></tr></table>	
●	AQR(3)(B) The student analyzes and evaluates risk and return in the context of real-world problems. **The student is expected to use probabilities to make and justify decisions about risks in everyday life.**	AQR(4)(E) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to use probabilities to make and justify decisions about risks in everyday life.**	The revised SE has been placed into the probabilistic and statistical reasoning strand.	

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●	AQR(3)(C) The student analyzes and evaluates risk and return in the context of real-world problems. **The student is expected to calculate expected value to analyze mathematical fairness, payoff, and risk.**	AQR(4)(F) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to calculate expected value to analyze mathematical fairness, payoff, and risk.**	The revised SE has been placed into the probabilistic and statistical reasoning strand.	
+		AQR(4)(B) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to use the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, in mathematical and real-world problems.**		

Advanced Quantitative Reasoning – Mathematics

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● AQR(4)(A) The student makes decisions based on understanding, analysis, and critique of reported statistical information and statistical summaries. **The student is expected to identify limitations or lack of information in studies reporting statistical information, including when studies are reported in condensed form.**	AQR(4)(H) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to identify limitations and lack of relevant information in studies reporting statistical information, especially when studies are reported in condensed form.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Students may be expected to identify limitations and the lack of relevant information in a study.	
●+ AQR(4)(B) The student makes decisions based on understanding, analysis, and critique of reported statistical information and statistical summaries. **The student is expected to interpret and compare the results of polls, given a margin of error.**	AQR(4)(I) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to interpret and compare statistical results**	The revised SE has been placed into the probabilistic and statistical reasoning strand. The "results of polls" has been rephrased as "statistical results."	
	using appropriate technology	Students may be expected to use technology to interpret and compare statistical results.	
	given a margin of error.		

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● AQR(4)(C) The student makes decisions based on understanding, analysis, and critique of reported statistical information and statistical summaries. **The student is expected to identify uses and misuses of statistical analyses in studies reporting statistics or using statistics to justify particular conclusions.**	AQR(4)(J) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to identify potential misuses of statistics to justify particular conclusions, including assertions of a cause-and-effect relationship rather than an association, and missteps or fallacies in logical reasoning.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been added to identify misuses of association as cause-and-effect and logical reasoning as applying missteps or producing fallacies.	
● AQR(4)(D) The student makes decisions based on understanding, analysis, and critique of reported statistical information and statistical summaries. **The student is expected to describe strengths and weaknesses of sampling techniques, data and graphical displays, and interpretations of summary statistics or other results appearing in a study.**	AQR(4)(K) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to describe strengths and weaknesses of sampling techniques, data and graphical displays, and interpretations of summary statistics and other results appearing in a study, including reports published in the media.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been added to include results published in the media.	

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●+	AQR(5)(A) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to determine the purpose of a statistical investigation and what type of statistical analysis can be used to answer a specific question or set of questions.**	AQR(4)(L) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to determine**	The revised SE has been placed into the probabilistic and statistical reasoning strand.	
		the need for and	Students may be expected to determine whether a statistical investigation is needed based on the posed question or set of questions.	
		purpose of a statistical investigation and what type of statistical analysis can be used to answer a specific question or set of questions.	Students may be expected to determine the purpose, or outcome, of a statistical investigation in order to determine the appropriate statistical analysis.	
●	AQR(5)(B) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to identify the population of interest, select an appropriate sampling technique, and collect data.**	AQR(4)(M) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to identify the population of interest for a statistical investigation, select an appropriate sampling technique, and collect data.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been provided as to the type of investigation for which students may be expected to identify the population of interest.	

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●	AQR(5)(C) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to identify the variables to be used in a study.**	AQR(4)(N) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to identify the variables to be used in a study.**	The revised SE has been placed into the probabilistic and statistical reasoning strand.	
●	AQR(5)(D) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to determine possible sources of statistical bias in a study and how such bias may affect the ability to generalize the results.**	AQR(4)(O) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to determine possible sources of statistical bias in a study and how bias may affect the validity of the results.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. In determining validity, students may be expected to consider whether the study produces generalizable results.	

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● AQR(5)(E) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to create data displays for given data sets to investigate, compare, and estimate center, shape, spread, and unusual features.**	AQR(4)(P) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to create data displays for given data sets to investigate, compare, and estimate center, shape, spread, and unusual features of the data.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Unusual features of data may include the existence of outliers and skewed data distributions.	
● AQR(5)(F) The student applies statistical methods to design and conduct a study that addresses one or more particular question(s). **The student is expected to determine possible sources of variability of data, including those that can be controlled and those that cannot be controlled.**	AQR(4)(Q) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to analyze possible sources of data variability, including those that can be controlled and those that cannot be controlled.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. In analyzing possible sources of data variability, students may be able to identify a source or sources of data variability.	

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AQR(6)(A) The student communicates the results of reported and student-generated statistical studies. ● **The student is expected to report results of statistical studies, including selecting an appropriate presentation format, creating graphical data displays, and interpreting results in terms of the question studied.**	AQR(4)(R) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to report results of statistical studies to a particular audience, including selecting an appropriate presentation format, creating graphical data displays, and interpreting results in terms of the question studied.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been added to report to a particular audience. When this SE is paired with mathematical process standard AQR(1)(D) and AQR(1)(E), students may justify the selected presentation format given the particular audience.	
AQR(6)(B) The student communicates the results of reported and student-generated statistical studies. ● **The student is expected to justify the design and the conclusion(s) of statistical studies, including the methods used for each.**	AQR(4)(S) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to justify the design and the conclusion(s) of statistical studies, including the methods used.**	The revised SE has been placed into the probabilistic and statistical reasoning strand.	

Advanced Quantitative Reasoning – Mathematics

	Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●	AQR(6)(C) The student communicates the results of reported and student-generated statistical studies. **The student is expected to communicate statistical results in both oral and written formats using appropriate statistical language.**	AQR(4)(T) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to communicate statistical results in oral and written formats using appropriate statistical and nontechnical language.**	The revised SE has been placed into the probabilistic and statistical reasoning strand. Specificity has been added to include both statistical and nontechnical language when communicating results.	

Advanced Quantitative Reasoning – Mathematics

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AQR(7)(A) The student analyzes the mathematics behind various methods of ranking and selection. **—** **The student is expected to apply, analyze, and compare various ranking algorithms to determine an appropriate method to solve a real-world problem.**		This skill is not included within the Revised Mathematics TEKS (2012).	
AQR(7)(B) The student analyzes the mathematics behind various methods of ranking and selection. ● **The student is expected to analyze and compare various voting and selection processes to determine an appropriate method to solve a real-world problem.**	AQR(2)(G) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to analyze various voting and selection processes to compare results in given situations.**	The revised SE has been placed into the numeric reasoning strand. When this SE is paired with mathematical process standard AQR(1)(A), given situations may include real-world problems. Students may be expected to compare different processes while analyzing the processes. The emphasis shifts from the comparison of processes to the comparison of results.	

Advanced Quantitative Reasoning – Mathematics

	Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●	AQR(8)(A) The student models data, makes predictions, and judges the validity of a prediction. **The student is expected to determine if there is a linear relationship in a set of bivariate data by finding the correlation coefficient for the data and interpret the coefficient as a measure of the strength and direction of the linear relationship.**	AQR(3)(A) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to collect numerical bivariate data to create a scatterplot, select a function to model the data, justify the model selection, and use the model to interpret results and make predictions.**	The revised SEs have been combined into one SE and placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand.	
●	AQR(8)(B) The student models data, makes predictions, and judges the validity of a prediction. **The student is expected to collect numerical bivariate data; use the data to create a scatterplot; and select a function such as linear, exponential, logistic, or trigonometric to model the data.**			
●	AQR(8)(C) The student models data, makes predictions, and judges the validity of a prediction. **The student is expected to justify the selection of a function to model data and use the model to make predictions.**			
+		AQR(3)(B) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.**		

Advanced Quantitative Reasoning – Mathematics

	Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●	AQR(9)(A) The student uses mathematical models to represent, analyze, and solve real-world problems involving change. **The student is expected to analyze and determine appropriate growth or decay models, including linear, exponential, and logistic functions.**	AQR(3)(C) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to determine or analyze an appropriate growth or decay model for problem situations, including linear, exponential, and logistic functions.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to determine an appropriate growth or decay model or to analyze a given appropriate model for growth or decay for a problem situation.	
●	AQR(9)(B) The student uses mathematical models to represent, analyze, and solve real-world problems involving change. **The student is expected to analyze and determine an appropriate cyclical model that can be modeled with trigonometric functions.**	AQR(3)(D) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to determine or analyze an appropriate cyclical model for problem situations that can be modeled with periodic functions.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to determine an appropriate cyclical model or to analyze a given appropriate cyclical model for a problem situation. Periodic functions may include cyclical models that are not trigonometric functions.	

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
● AQR(9)(C) The student uses mathematical models to represent, analyze, and solve real-world problems involving change. **The student is expected to analyze and determine an appropriate piecewise model.**	AQR(3)(E) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to determine or analyze an appropriate piecewise model for problem situations.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to determine an appropriate piecewise model or to analyze a given appropriate piecewise model for a problem situation.	
●+ AQR(9)(D) The student uses mathematical models to represent, analyze, and solve real-world problems involving change. **The student is expected to solve problems using recursion or iteration.**	AQR(2)(H) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to select and apply an algorithm of interest to solve real-life problems such as problems using**	The revised SE has been placed into the numeric reasoning strand. Specificity has been added to solving problems. Students may be expected to select and apply an algorithm of interest. Specificity has been added for how to solve real-life problems related to recursion or iteration.	
	recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and	This complements mathematical process standards AQR(1)(D) and AQR(1)(G) with the inclusion of nontechnical language.	
	problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees		
	and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.	The intended audience for this communication is identified as peers who may or may not be classmates.	

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●+ AQR(10)(A) The student creates and analyzes mathematical models to make decisions related to earning, investing, spending, and borrowing money to evaluate real-world situations. **The student is expected to determine, represent, and analyze mathematical models for various types of income calculations.**	AQR(3)(F) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to create, represent, and analyze mathematical models for various types of income calculations to determine the best option for a given situation.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to create or generate, rather than determine or identify, mathematical models for income calculations. Specificity has been added for the purpose of representing and analyzing models. The purpose is to determine the best option for a given situation.	
●+ AQR(10)(B) The student creates and analyzes mathematical models to make decisions related to earning, investing, spending, and borrowing money to evaluate real-world situations. **The student is expected to determine, represent, and analyze mathematical models for expenditures, including those involving credit.**	AQR(3)(G) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to create, represent, and analyze mathematical models for expenditures, including those involving credit, to determine the best option for a given situation.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to create or generate, rather than determine or identify, mathematical models for expenditures. Specificity has been added for the purpose of representing and analyzing models. The purpose is to determine the best option for a given situation.	

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●+ AQR(10)(C) The student creates and analyzes mathematical models to make decisions related to earning, investing, spending, and borrowing money to evaluate real-world situations. **The student is expected to determine, represent, and analyze mathematical models for various types of loans and investments.**	AQR(3)(H) **Algebraic reasoning (expressions, equations, and generalized relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. **The student is expected to create, represent, and analyze mathematical models and appropriate representations, including formulas and amortization tables, for various types of loans and investments to determine the best option for a given situation.**	The revised SE has been placed into the algebraic reasoning (expressions, equations, and generalized relationships) strand. Students may be expected to create or generate, rather than determine or identify, mathematical models for loans and investments. Specificity has been added for mathematical models to include formulas and amortization tables. Specificity has been added for the purpose of representing and analyzing models. The purpose is to determine the best option for a given situation.	

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
●+ AQR(11)(A) The student uses a variety of network models represented graphically to organize data in quantitative situations, make informed decisions, and solve problems. **The student is expected to solve problems involving scheduling or routing situations that can be represented by methods such as a vertex-edge graph using critical paths, Euler paths, or minimal spanning trees.**	AQR(2)(H) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and** **problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees** **and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.**	The revised SE has been placed into the numeric reasoning strand. Specificity has been added to solving problems. Students may be expected to select and apply an algorithm of interest. Specificity has been added for how to solve real-life problems related to recursion or iteration. This complements mathematical process standards AQR(1)(D) and AQR(1)(G) with the inclusion of nontechnical language. The intended audience for this communication is identified as peers who may or may not be classmates.	
— AQR(11)(B) The student uses a variety of network models represented graphically to organize data in quantitative situations, make informed decisions, and solve problems. **The student is expected to construct, analyze, and interpret flow charts in order to develop and describe problem-solving procedures.**		This skill is not included within the Revised Mathematics TEKS (2012).	

Advanced Quantitative Reasoning – Mathematics

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
+	AQR(4)(G) **Probabilistic and statistical reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. **The student is expected to determine the validity of logical arguments that include compound conditional statements by constructing truth tables.**		

Advanced Quantitative Reasoning – Mathematics

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
AQR(12)(A) The student uses a variety of tools and methods to represent and solve problems involving static and dynamic situations. ● **The student is expected to create and use two- and three-dimensional representations of authentic situations using paper techniques or dynamic geometric environments for computer-aided design and other applications.**	AQR(2)(D) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to solve geometric problems involving indirect measurement, including similar triangles, the Pythagorean Theorem, Law of Sines, Law of Cosines, and the use of dynamic geometry software.**	The revised SE has been placed into the numeric reasoning strand. Specificity has been added for authentic situations. These situations should involve indirect measurement. Specificity for paper techniques has been added to include proportions with similar triangles, the Pythagorean Theorem, Law of Sines, and Law of Cosines. "Dynamic geometric environments for computer-aided design and other applications" has been rephrased as "the use of dynamic geometry software."	

AQR(12)(B) The student uses a variety of tools and methods to represent and solve problems involving static and dynamic situations.
 	
▬ **The student is expected to use vectors to represent and solve applied problems.**
		The content of this SE was moved to Precalculus:
		Number and measure
		    P(4)(I)
		    P(4)(J)
		    P(4)(K)	

AQR(12)(C) The student uses a variety of tools and methods to represent and solve problems involving static and dynamic situations. ● **The student is expected to use matrices to represent geometric transformations and solve applied problems.**	AQR(2)(F) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to use arrays to efficiently manage large collections of data and add, subtract, and multiply matrices to solve applied problems, including geometric transformations.**	The revised SE has been placed into the numeric reasoning strand. Specificity has been added regarding the purpose for the use of matrices to include the efficient management of large collections of data. Specificity has been added that students may be expected to add, subtract, and multiply matrices when solving applied problems.	

Old TEKS	Current TEKS (2012)	Supporting Information	Notes
● AQR(12)(D) The student uses a variety of tools and methods to represent and solve problems involving static and dynamic situations. **The student is expected to solve geometric problems involving inaccessible distances such as those encountered when building a bridge, constructing a skyscraper, or mapping planetary distances.**	AQR(2)(D) **Numeric reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. **The student is expected to solve geometric problems involving indirect measurement, including similar triangles, the Pythagorean Theorem, Law of Sines, Law of Cosines, and the use of dynamic geometry software.**	The revised SE has been placed into the numeric reasoning strand. "Inaccessible distances such as those encountered when building a bridge, constructing a skyscraper, or mapping planetary distances" has been summarized as "indirect measurement." Specificity has been added to the mathematics that students may be expected to apply when solving geometric problems to include proportions with similar triangles, the Pythagorean Theorem, Law of Sines, and Law of Cosines, and the tool that students may be expected to use related to dynamic geometry software. When this SE is paired with mathematical process standard AQR(1)(A), students may be expected to solve geometric problems such as those encountered when building a bridge, constructing a skyscraper, or mapping planetary distances.	