

Mathematical Ways of Knowing

General Education Skill Competency and Knowledge Objectives

Definition:

Coursework in this area is intended to develop an understanding of mathematical reasoning processes and the ability to utilize these processes to solve college-level mathematical problems.

Competency and Knowledge Objectives:

To meet the mathematics requirement of the general education core, courses must cover the competency/knowledge objectives below.

1. Interpret mathematical concepts.
2. Represent information/data.
3. Use appropriate strategies/procedures when solving mathematical problems.
4. Draw reasonable conclusions based on quantitative information.

Updated competencies approved by SBOE 10-21-2021

Value Rubric: Mathematical Ways of Knowing

	Meets End-of-Course Expectations	Partially Meets End-of-Course Expectations	Does Not Meet End-of-Course Expectations
<p>COMPETENCY 1: Interpret mathematical concepts.</p> <p><i>Ability to explain information presented in mathematical forms (e.g. equations, graphs, diagrams, tables, notation/mathematical symbols, words)</i></p>	<p>Provides accurate explanations of information presented in mathematical forms.</p> <p>For example,</p> <ul style="list-style-type: none"> • Uses appropriate mathematical language to explain course concepts consistently • Or completely explains mathematical notation or abstractions related to course material 	<p>Provides foundational but incomplete explanations of information presented in mathematical forms.</p> <p>For example,</p> <ul style="list-style-type: none"> • Uses appropriate mathematical language to explain course concepts inconsistently • Or partially explains mathematical notation or abstractions related to course material 	<p>Provides inaccurate explanations of information presented in mathematical forms or provides no explanation.</p> <p>For example,</p> <ul style="list-style-type: none"> • Uses inappropriate mathematical language to explain course concepts. • Or inaccurately explains mathematical notation or abstractions related to course material
<p>COMPETENCY 2: Represent information/data.</p> <p><i>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i></p>	<p>Competently converts relevant information into an appropriate and desired mathematical portrayal.</p> <p>For example,</p> <ul style="list-style-type: none"> • Appropriately represents data with a table or graph, such as a line graph, bar graph, circle graph, boxplot, scatterplot, or frequency distribution, etc. • Or appropriately represents information with a function, equation, inequality, graph, table, drawing, diagram, words, etc. 	<p>Partially converts relevant information into an appropriate and desired mathematical portrayal.</p> <p>For example,</p> <ul style="list-style-type: none"> • Partially represents data with a table or graph, such as a line graph, bar graph, circle graph, boxplot, scatterplot, or frequency distribution, etc. • Or partially represents information with a function, equation, inequality, graph, table, drawing, diagram, words, etc. 	<p>Inappropriately converts relevant information into an appropriate and desired mathematical portrayal.</p> <p>For example,</p> <ul style="list-style-type: none"> • Inappropriately represents data graphically with a table or graph, such as a line graph, bar graph, circle graph, boxplot, scatterplot, or frequency distribution, etc. • Or inappropriately represents information with a function, equation, inequality, graph, table, drawing, diagram, words, etc.

	Meets End-of-Course Expectations	Partially Meets End-of-Course Expectations	Does Not Meet End-of-Course Expectations
<p>COMPETENCY 3: Use appropriate strategies/procedures when solving mathematical problems.</p> <p><i>Ability to approach a problem in an appropriate and comprehensive way</i></p>	<p>Calculations attempted are appropriate and sufficiently comprehensive to solve the problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Applies an appropriate strategy or technique that is sufficient to solve the problem. • Performs a process that is adequate to solve the problem. 	<p>Calculations attempted are appropriate but are insufficient to solve the problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Partially applies an appropriate strategy or technique that is sufficient to solve the problem. • Partially performs a process that is adequate to solve the problem. 	<p>Calculations attempted are inappropriate and insufficient to solve the problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Applies an inappropriate strategy or technique that is sufficient to solve the problem. • Performs a process that is inadequate to solve the problem.
<p>COMPETENCY 4: Draw reasonable conclusions based on quantitative information.</p> <p><i>Ability to evaluate the reasonableness of the conclusion or result for a real world mathematical problem</i></p>	<p>Successfully evaluates the reasonableness of the result for a real-world mathematical problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Demonstrates that the conclusion correctly addresses the problem. • Draws valid conclusions from analysis. • Or adequately checks the solution to confirm that it is reasonable. 	<p>Partially evaluates the reasonableness of the result for a real-world mathematical problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Partially demonstrates that the conclusion correctly addresses the problem. • Draws partially valid conclusions from analysis. • Or inadequately checks the solution to confirm that it is reasonable. 	<p>Does not evaluate the reasonableness of the result for a real-world mathematical problem.</p> <p>For example,</p> <ul style="list-style-type: none"> • Does not demonstrate that the conclusion correctly addresses the problem. • Does not draw valid conclusions from analysis. • Or does not check the solution to confirm that it is reasonable.