

Standards and Rubrics for Assessing General Education in Mathematics

Written by the Discipline Panel in Mathematics – (09/08/05)

Learning Outcome #1: Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.

Rubric:

Level	
Completely Correct (CC)	<ul style="list-style-type: none">• The student demonstrates the ability to interpret the variables, parameters, and/or other specific information given in the model.• The student uses the model to draw inferences about the situation being modeled in a manner that is correct and evident.• The interpretation(s) and inference(s) completely and accurately represent the model or answers the question(s),
Generally Correct (GC)	<ul style="list-style-type: none">• The student demonstrates the ability to interpret the variables, parameters, and/or other specific information given in the model. The interpretation may contain minor flaws.• The student uses the model to draw inferences about the situation being modeled in a manner that may contain some minor flaw(s).• The interpretation(s) and/or inference(s) are incomplete or inaccurate due to a minor flaw, such as a computational or copying error or mislabeling.
Partially Correct (PC)	<ul style="list-style-type: none">• The student makes no appropriate attempt to interpret the variables, parameters, and/or other specific information given in the model due to major conceptual misunderstandings.• The student attempts to use the model to make the required inference(s) and/or interpretation(s) but lacks a clear understanding of how to do so.• The interpretation(s) and/or inference(s) are incomplete or inaccurate due to a major conceptual flaw.
Incorrect Solution (IC)	<ul style="list-style-type: none">• The student cannot demonstrate an ability to interpret the variables, parameters, and/or other specific information given in the model.• The student cannot use the model to make the required interpretation(s) and/or inference(s).• The interpretation(s) and/or inference(s) are missing or entirely inaccurate.• The student's response does not address the question in any meaningful way

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	<ul style="list-style-type: none">• There is no response at all.
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Learning Outcome #2: Students will demonstrate the ability to represent mathematical information symbolically, visually, numerically and verbally.

Rubric:

Level	
Completely Correct (CC)	<ul style="list-style-type: none">• The student fully understands the mathematical information and employs the appropriate representation(s) to display the mathematical information.• The student correctly and accurately employs all the appropriate and required aspects of the representation to display the information.• The representation of the given information is correct and accurate. The student uses the correct format, mathematical terminology, and/or language. Variables are clearly defined, graphs are correctly labeled and scaled, and the representation is otherwise complete as required.
Generally Correct (GC)	<ul style="list-style-type: none">• The student understands most of the important aspects of the mathematical information and employs the appropriate representation(s) to display the mathematical information with possibly minor flaws such as a simple misreading of the problem or copying error or mislabeling.• The student correctly and accurately employs most of the appropriate and required aspects of the representation to display the information. The representation is lacking in a minor way such as a simple misreading of the problem or copying error or mislabeling.• There is a misrepresentation of the information due to a minor computational/copying error. The student uses mostly correct format, mathematical terminology, and/or language. Variables are clearly defined, graphs are correctly labeled and scaled, but the representation is incomplete in some minor way.
Partially Correct	<ul style="list-style-type: none">• The student does not fully understand the

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(PC)	<p>important aspects of the mathematical information and employs the appropriate representation(s) to display the mathematical information with major conceptual flaws.</p> <ul style="list-style-type: none">• The student shows some knowledge of how to employ most of the appropriate and required aspects of the representation to display the information. The representation is lacking in a major way.• The representation(s) show some reasonable relation to the information but contains major flaws. The student uses some correct format, mathematical terminology, and/or language. Variables are clearly defined, graphs are correctly labeled and scaled, but the representation is incomplete in some major conceptual way.
Incorrect Solution (IC)	<ul style="list-style-type: none">• The student cannot represent the mathematical information in the representation(s) required.• The student completely misinterprets and/or misrepresents the information.• The representation(s) is incomprehensible or unrelated to the given information. The process of developing the representation is entirely incorrect.• The student's response does not address the question in any meaningful way.• There is no response at all.

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Learning Outcome #3: Students will demonstrate the ability to employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems.

Rubric:

Level	
Completely Correct (CC)	<ul style="list-style-type: none">• The student demonstrates a full understanding of the problem and/or can identify a specific numeric, algebraic, geometric, or statistical method(s) that is needed to solve the problem.• The student uses the method(s) to solve the problem. The plan for the solution is clear, logical and evident.• The solution is accurate and complete.
Generally Correct (GC)	<ul style="list-style-type: none">• The student demonstrates some understanding of the problem and/or can identify the specific arithmetic, algebraic, geometric or statistical method(s) needed to solve the problem.• The student uses the method(s) to solve the problem. The plan for the solution is clear, logical and evident but is lacking in a minor way such as a simple misreading of the problem or copying error.• The solution is generally correct but may contain a minor flaw(s).
Partially Correct (PC)	<ul style="list-style-type: none">• The student demonstrates only a slight understanding of the problem. The student has difficulty identifying the specific arithmetic, algebraic, geometric or statistical method(s) needed to solve the problem.• The student attempts to use a method(s) that will solve the problem, but the method itself or the implementation of it, is generally incorrect. The plan is not evident or logical.• The solution contains some correct aspects though there exists major conceptual flaw(s).
Incorrect Solution (IC)	<ul style="list-style-type: none">• The student demonstrates no understanding of the problem and/or he/she cannot identify the specific arithmetic, algebraic, geometric or statistical method(s) needed to solve the problem.• The student cannot to use a method(s) that will solve the problem. Little or no work is shown that in any way relates to the correct solution of the problem• The student's response does not address the question in any meaningful way.• There is no response at all.

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Learning Outcome #4: Students will demonstrate the ability to estimate and check mathematical results for reasonableness

Rubric:

Level	
Completely Correct (CC)	<ul style="list-style-type: none">• The student can estimate and justify a mathematical result to a problem.• The student can articulate a justification for the estimate and the estimate has been found using a clearly defined, logical plan• The student's response is complete and accurate.
Generally Correct (GC)	<ul style="list-style-type: none">• The student can estimate and justify a mathematical result to a problem but the estimate or justification contains a minor flaw such as a simple misreading of the problem or computational or copying error or mislabeling.• The student can articulate a justification for the estimate but the student's justification and/or estimate has been found was lacking in some minor way• The student's response addresses all aspects of the question but is lacking in some minor way.
Partially Correct (PC)	<ul style="list-style-type: none">• The student can estimate and justify a mathematical result to a problem but the estimate or justification contains a major conceptual flaw.• The student can articulate a justification for the estimate but the student's justification and/or estimate has been found was lacking in some major conceptual way• The student's response addresses some aspect of the question correctly but is lacking in a significant way.
Incorrect Solution (IC)	<ul style="list-style-type: none">• The student cannot estimate and/or justify a mathematical result to a problem.• The student's justification is not supported by any logic plan.• The student's response does not address the question in any meaningful way.• There is no response at all.

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Learning Outcome #5: Students will demonstrate the ability to recognize the limits of mathematical and statistical methods.

Rubric:

Level	
Completely Correct (CC)	<ul style="list-style-type: none">• Student clearly articulates the assumptions/simplifications made in developing a mathematical/statistical model or implementing method(s) or technique(s).• Student provides an accurate description how the results from the model might differ from the real life situation it models.
Generally Correct (GC)	<ul style="list-style-type: none">• Student articulates most of the assumptions/simplifications made in developing a mathematical/statistical model or implementing method(s) or technique(s)• Student provides a generally correct description of how the results from the model might differ from the real life situation it models
Partially Correct (PC)	<ul style="list-style-type: none">• Student articulates only some of the assumptions/simplifications made in developing a mathematical/statistical model or implementing method(s) or technique(s).• Student indicates that the conclusions drawn from the model differ from real life but is unable to articulate the cause(s).
Incorrect Solution (IC)	<ul style="list-style-type: none">• Student does not articulate any assumptions/simplifications made in developing a mathematical/statistical model or implementing method(s) or technique(s).• Student fails to realize that the results are not contextually appropriate.• There was no response at all.