

MATHEMATICS SCORING RUBRIC: A GUIDE TO SCORING SHORT-ANSWER ITEMS

SCORE LEVEL	<u>MATHEMATICAL KNOWLEDGE</u>	<u>STRATEGIC KNOWLEDGE</u>	<u>EXPLANATION</u>
	Knowledge of mathematical principles and concepts which result in a correct solution to a problem	Identification of important elements of the problem and the use of models, diagrams, symbols, and/or algorithms to systematically represent and integrate concepts	Written explanation and rationales that translate into words the steps of the solution process and provide justification for each step Note: the length of response, grammar, and syntax are not the critical elements of this dimension.
4	<ul style="list-style-type: none"> * shows complete understanding of the problem's mathematical concepts and principles * uses appropriate mathematical terminology and notation (e.g. labels answer as appropriate) * executes algorithms completely and correctly 	<ul style="list-style-type: none"> * identifies all the important elements of the problem and shows complete understanding of the relationships among elements * reflects an appropriate and systematic strategy for solving the problem * gives clean evidence of a complete and systematic solution process 	<ul style="list-style-type: none"> * gives a complete written explanation of the solution process employed: explanation addresses both what was done, and why it was done * if a diagram is appropriate, there is a complete explanation of all the elements in the diagram
3	<ul style="list-style-type: none"> * shows nearly complete understanding of the problem's mathematical concepts and principles * uses nearly correct mathematical terminology and notations * executes algorithms completely; computations are generally correct but may contain minor errors 	<ul style="list-style-type: none"> * identifies most of the important elements of the problem and shows general understanding of the relationships among them * reflects an appropriate strategy for solving the problem * solution process is nearly complete 	<ul style="list-style-type: none"> * gives a nearly complete written explanation of the solution process employed; clearly explains what was done and begins to address why it was done * may include a diagram with most of the elements explained
2	<ul style="list-style-type: none"> * shows some understanding of the problem's mathematical concepts and principles * may contain major computational errors 	<ul style="list-style-type: none"> * identifies some important elements of the problem but shows only limited understanding of the relationships among them * appears to reflect an appropriate strategy but application of strategy is unclear, or inappropriate strategy is applied logically and consistently * gives some evidence of a solution process 	<ul style="list-style-type: none"> * gives some explanation of the solution process employed, either what was done or rationale for solution process is presented but not both; communication is vague or difficult to interpret * may include a diagram with some of the elements explained
1	<ul style="list-style-type: none"> * shows limited to no understanding of the problem's mathematical concepts and principles * may misuse or fail to use mathematical terms * may contain major computational errors 	<ul style="list-style-type: none"> * fails to identify important elements or places too much emphasis on unimportant elements * may reflect an inappropriate or inconsistent strategy for solving the problem * gives minimal evidence of a solution process: process may be difficult to identify * may attempt to use irrelevant outside information 	<ul style="list-style-type: none"> * provides minimal explanation of solution process; may fail to explain or may omit information about what was done * explanation does not match presented solution process * may include minimal discussion of elements in diagram: explanation of significant elements is unclear
0	<ul style="list-style-type: none"> * no answer attempted 	<ul style="list-style-type: none"> * no apparent strategy 	<ul style="list-style-type: none"> * no written explanation of the solution process is provided

Footnote: "As appropriate" or "if appropriate" relates to whether or not the specific elements are called for in the stem of the item.
From Illinois State Board of Education, 1998

Adapted from Lane (1993)