

**Rubric for evaluating student math problem solving skills**

Skill		Level of Achievement				
		1	2	3	4	5
1	Understanding of problem	No clear understanding indicated;  Lack of comprehension of the basic parts of the problem;  Didn't understand enough to start to work the problem;	Exhibits some characteristics of '1' and some characteristics of '3'	Able to glean basic parts of the problem and the general framework;  No serious misconceptions; Adequate to work most of the problem;	Exhibits some characteristics of '3' and some characteristics of '5'	Full grasp of concepts and relationships between concepts;  Identifies all the important elements of the problem;
2	Use of terms and symbols	Unable to communicate any math concepts though terminology;  Absent of technical or mathematical terms, or used inappropriately;  Mathematical symbols are not used, or used incorrectly;		Uses most terminology and symbols correctly;  Evidence of reasonable understanding of terms and symbols;		Clear, concise communication of ideas;  Thoughts thoroughly explained with the correct terminology and clearly displayed appropriate symbols;  Demonstrates superior knowledge of the language of mathematics/science
3	Calculations	No evidence of manipulation of mathematical expressions;  Arithmetic errors prevalent in the work;		Mainly accurate with some minor arithmetic errors;  Appropriate to work the problem, but not a sophisticated presentation;		Fully arithmetically accurate;  Clearly represented with various computation steps shown;  Executes algorithms completely and correctly;
4	Solution	Shows significant misunderstanding of the process;  Does not correctly apply or even make attempt to apply appropriate solution;  Reflects inappropriate strategy for solving the problem;  Attempts to use irrelevant information;  No (or incorrect) graphical representation of the mathematical thought process;		Reflects reasonable strategy for solving most of the problem;  Displayed in a rote manner showing simple conceptualization;  Shows understanding of some of the problem's mathematical concepts;  Presented in an orderly manner, but lacking some details;  Represented graphically with only minor flaws;		Represented with detail through logical sequence and systematic progression;  Reflects excellent problem-solving skills;  Presents strong supporting arguments;  Use of relevant outside information;  Results are represented graphically in clear and illuminating way;
5	Answer	No expression of any empirical finding;  Units if stated are incorrect;  Conclusion is not valid;		Expressed empirical findings but limited in identification of related issues;  Answer is stated in correct units;		Complete response with a clear, unambiguous, accurate explanation;  Fully described findings in words;  Stated in correct units with any unit changes clearly illustrated;
6	Difficulty of Problem	Values plug directly into equation;  No mathematical manipulation;		Combines two related concepts;		Requires multiple steps with development of concepts evolving into the solution;

