

## General Mathematics Rubric

	<b>1 - Beginning Steps</b>	<b>2 - Nearing Proficient</b>	<b>3 - Proficient</b>	<b>4 - Advanced</b>
<p style="text-align: center;"><b>Conceptual Understanding</b></p> <p><b>Question:</b> Does the student's interpretation of the problem using mathematical representations &amp; procedures accurately reflect the important mathematics in the problem?</p>	<ul style="list-style-type: none"> <li>▪ Mathematical representations of the problem are incorrect</li> <li>▪ Used wrong information in trying to solve the problem</li> <li>▪ Mathematical procedures used would not lead to a correct solution</li> <li>▪ Used incorrect mathematical terminology</li> </ul>	<ul style="list-style-type: none"> <li>▪ Choice of forms to represent the problem are inefficient or inaccurate</li> <li>▪ Response is not completely related to the problem</li> <li>▪ Mathematical procedures used led to a partially correct solution</li> <li>▪ Used mathematical terminology imprecisely</li> </ul>	<ul style="list-style-type: none"> <li>▪ Choice of mathematical representations of the problem are appropriate</li> <li>▪ Used all relevant information from the problem in the solution</li> <li>▪ Mathematical procedures chosen led to a correct solution</li> <li>▪ Used mathematical terminology correctly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Choice of mathematical representations helped clarify the problem's meaning</li> <li>▪ Uncovered hidden or implied information not readily apparent</li> <li>▪ Mathematical procedures chosen led to an elegant solution</li> <li>▪ Used mathematical terminology precisely</li> </ul>
<p style="text-align: center;"><b>Strategies &amp; Reasoning</b></p> <p><b>Question:</b> Is there evidence that the student proceeded from a plan, applied appropriate strategies, and followed a logical and verifiable process toward a solution?</p>	<ul style="list-style-type: none"> <li>▪ Strategies are not appropriate for the problem</li> <li>▪ Did not seem to know where to begin</li> <li>▪ Reasoning did not support the work</li> <li>▪ No apparent relationship between the representation and the task</li> <li>▪ No apparent logic to the solution</li> <li>▪ Approach to the problem will not lead to a correct solution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used an oversimplified approach to the problem</li> <li>▪ Offered little or no explanation of strategies</li> <li>▪ Representations accurately depicted aspects of the problem</li> <li>▪ Made leaps of logic that are hard to follow</li> <li>▪ Process led to a partially complete solution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chose an appropriate, efficient strategies to solve the problem</li> <li>▪ Justified each step of their work</li> <li>▪ Representation(s) fit the task</li> <li>▪ Logic of the solution is apparent</li> <li>▪ Process led to a complete, correct solution of the problem</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chose innovative and insightful strategies for solving the problem</li> <li>▪ Proved that their solution is correct and valid</li> <li>▪ Provided examples and counterexamples to support solution</li> <li>▪ Used a sophisticated approach to solve the problem</li> </ul>

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<p><b>Computation &amp; Execution</b></p> <p><b>Question:</b> Given the approach taken by the student, is the solution performed in an accurate and complete manner?</p>	<ul style="list-style-type: none"> <li>▪ Errors in computation are serious enough to flaw the solution</li> <li>▪ Mathematical representations are inaccurate</li> <li>▪ Labeled incorrectly</li> <li>▪ Solution is incorrect</li> <li>▪ No evidence of how s/he arrived at an answer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Made minor computation errors</li> <li>▪ Representations are essentially correct but not accurately and completely labeled</li> <li>▪ Inefficient choice of procedures impeded success</li> <li>▪ Evidence of solution is inconsistent or unclear</li> </ul>	<ul style="list-style-type: none"> <li>▪ Computations are accurate</li> <li>▪ Representations are complete and accurate</li> <li>▪ Solution is correct</li> <li>▪ Work clearly supports solution</li> </ul>	<ul style="list-style-type: none"> <li>▪ All aspects of the solution were completely accurate</li> <li>▪ Used multiple representations to verify solution</li> <li>▪ Showed multiple ways to compute the answer</li> </ul>
<p><b>Communication</b></p> <p><b>Question:</b> Was I able to easily understand the student's thinking, or did I have to make inferences and guesses about what they were trying to do?</p>	<ul style="list-style-type: none"> <li>▪ Could not follow thinking</li> <li>▪ Explanation rambled</li> <li>▪ Gave no explanation for work</li> <li>▪ Did not have a sense of what the audience needed to know</li> <li>▪ Mathematical representations did not help to clarify thinking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Solution is hard to follow in places</li> <li>▪ Have to make inferences about meaning</li> <li>▪ Is not able to sustain a good beginning</li> <li>▪ Explanation is redundant</li> <li>▪ Mathematical representations were somewhat helpful in clarifying thinking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Solution is well organized and easy to follow</li> <li>▪ Solution flowed logically for one step to the next</li> <li>▪ Used an effective format for communicating</li> <li>▪ Mathematical representations helped to clarify solution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Explanation was clear and concise</li> <li>▪ Communicated concepts with precision</li> <li>▪ Mathematical representations expanded on solution</li> <li>▪ Gave an in-depth explanation of reasoning</li> </ul>

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<b>Insights</b>  <b>Question:</b> Does the student grasp the deeper structure of the problem and see how the process used to solve this problem connects it to other problems or “real world” applications?	<ul style="list-style-type: none"> <li>▪ Unable to recognize patterns and relationships</li> <li>▪ Found a solution and then stopped</li> <li>▪ Found no connections to other disciplines or mathematical concepts</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognized some patterns and relationships</li> <li>▪ Found multiple solutions, but not all were correct</li> <li>▪ Solution hinted at a connection to an application or another area of mathematics</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognized important patterns and relationships in the problem</li> <li>▪ Found multiple solutions using different interpretations to the problem</li> <li>▪ Connect the solution process to other problems, areas of mathematics or applications</li> </ul>	<ul style="list-style-type: none"> <li>▪ Created a general rule of formula for solving related problems</li> <li>▪ Related the underlying structure of the problem to similar problems</li> <li>▪ Noted possible sources of error or ambiguity in the problem</li> <li>▪ Connection to a real-life application was accurate and realistic</li> </ul>