

## Proof Evaluation Rubric

### Mathematical correctness

0: Illogical	1: Serious mathematical flaws	2: Some mathematical flaws	3: Mathematically correct
<ul style="list-style-type: none"> <li>○ No solution attempted or no meaningful mathematics written</li> <li>○ Entirely inappropriate application of tools and theorems</li> <li>○ Answer with no explanation</li> <li>○ Style and/or lack of fluency makes it very difficult to check for mathematical correctness</li> <li>○ Does not resemble mathematical proof</li> </ul>	<ul style="list-style-type: none"> <li>○ Mathematical errors at key steps that may not be easily corrected and compromise the overall approach</li> <li>○ Inappropriate application of tools and theorems</li> <li>○ Incomplete explanations and/or logical inconsistencies</li> <li>○ Approach needs new ideas in order to work</li> <li>○ Does not qualify as mathematical proof</li> </ul>	<ul style="list-style-type: none"> <li>○ Mathematics is mostly correct and contains few errors</li> <li>○ Errors can be corrected and do not compromise the overall approach</li> <li>○ Appropriate applications of tools and theorems</li> <li>○ Logic behind the approach is sound</li> <li>○ Will qualify as mathematical proof if errors are corrected</li> </ul>	<ul style="list-style-type: none"> <li>○ Mathematics is correct and thoroughly explained</li> <li>○ Appropriate applications of tools and theorems</li> <li>○ Logic behind the approach is sound</li> <li>○ Certainly qualifies as mathematical proof</li> </ul>

### Style and mathematical fluency\*

0: Crippling style & fluency	1: Compromising style & fluency	2: Acceptable style & fluency	3: Great style & fluency
<ul style="list-style-type: none"> <li>○ No solution attempted or no meaningful mathematics written</li> <li>○ Illegible or incoherent at key points</li> <li>○ Key quantities left undefined</li> <li>○ Style and/or lack of fluency makes it very difficult to evaluate for mathematical correctness</li> </ul>	<ul style="list-style-type: none"> <li>○ Several jumps in reasoning</li> <li>○ Several conclusions that are not sufficiently explained</li> <li>○ Some key quantities left undefined</li> <li>○ Not well thought-out and/or little effort at organization</li> <li>○ Style and/or fluency makes it difficult to evaluate for mathematical correctness</li> </ul>	<ul style="list-style-type: none"> <li>○ Few jumps in reasoning</li> <li>○ Most conclusions are sufficiently explained</li> <li>○ Important quantities are defined</li> <li>○ Effort at organization and presentation is apparent</li> <li>○ Style and fluency aid in the evaluation for mathematical correctness</li> </ul>	<ul style="list-style-type: none"> <li>○ Clear flow of reasoning from beginning to end</li> <li>○ Easy to read and understand</li> <li>○ All quantities are defined</li> <li>○ Well thought out, organized, and presented</li> <li>○ Style and fluency make it simple to evaluate for mathematical correctness</li> </ul>

\*Mathematical fluency: *the correct use of mathematical language and notation, as well as English grammar, punctuation, and capitalization, so as to make the proof flow smoothly and be easy to read and understand.* (Moore, R., Mathematics Professors' Evaluation of Students' Proofs: A Complex Teaching Practice, *Int. J. Res. Undergrad. Math. Ed.* (2016) 2:246–278)