Problem 2
Due in DSC 222 by 12 noon, Friday, January 25, 2019

Problem: For what values of the constant \( c > 0 \) does the equation
\[
\ln(x) = cx^2
\]
have solutions?

Rules:
- The competition is open to all undergraduate UNO students and it is supervised by Upper Curriculum Committee of the Mathematics Department.
- Submit your solutions to Andrzej Roslanowski in DSC 222 or to his mailbox.
- Every nontrivial step/claim in your solution must justified. You may cite/quote a result from your textbook, past problems of the week and other widely available sources. In each case you have to give full reference.
- There are no partial credits, so rather err on the side of caution and provide more explanations than less. If you are not sure that your sources/references are appropriate, please include the complete relevant proofs from there.
- Your answers should be be written clearly and legibly. We reserve the right to refuse grading your work if it is difficult to read it.
- The winners of Spring 2019 edition of POW will be determined at the end of the semester based on the number of correct solutions submitted.
- Problems will be posted by Friday 5pm and the solutions are due by the following Friday 12 noon.

Prizes:
- Winners will receive books published by the American Mathematical Society. The titles actually awarded will be selected in cooperation with the awardees.
- Everybody scoring in the POW Competition qualifies for the grand finale: \( \frac{\pi}{2} \) Mathematical Competition.