

Problem ♡-5

Due in DSC 235 by 12 noon, Friday, October 13, 2017

Problem A: For $x > 0$, show that

$$\arctan(x) > \frac{3x}{1 + 2\sqrt{1 + x^2}}.$$

Problem B: Show that for all positive real numbers x, y the following inequality holds:

$$x^y + y^x > 1.$$

RULES:

- The competition is open to all *undergraduate* UNO students.
- Please submit your solutions to Andrzej Roslanowski in DSC 235 or to his mailbox. (Needless to say, they should be written clearly and legibly.)
- The winners will be determined each 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.
- In Summer 2018, there is a research opportunity possibly that could lead to an Erdős Number (3 or possibly 2). Strong performance in POW is one of the crucial prerequisites.