

University Math Challenge

February 13, 2024 to March 8, 2024

PROBLEM # 1

Let A be a positive 3-digit integer whose digits decrease from left to right. That is, the hundreds digit is larger than the tens digit, and the tens digit is larger than the ones digit. Let A' be the same integer A written backwards, so $A' < A$. Denote the positive difference $A - A'$ by B ; that is, $B = A - A'$. Denote by B' the same integer B but written backwards. Determine all possible values for the sum $B + B'$. Explain your answer.

*Direct any questions to
Grant Lakeland (OM 3226)*

Rules & Rewards

- Any undergraduate currently enrolled at EIU is eligible to participate.
- Each solution is to be the work of one individual and is to be submitted with the solver's name, year in school, email address, local address, and home address.
- Each solution is to be written or typed and is due in the main Mathematics Department office (OM 3611) by 2:00pm, Friday, March 8, 2024.
- Entries will be judged on the basis of clarity of exposition and elegance of the solution. That is to say, the *explanation* is more important than the answer.
- An award of \$50 will be given for the best solution. In the case of a two-way tie, the award will be evenly split. If there are more than two 'best' solutions, a drawing will be held for the reward. In the case no award is made for this week's challenge, \$50 will be added to the next week's award.
- Names of all solvers will be posted on the Challenge of the Month bulletin board and on the Challenge homepage: <http://www.eiu.edu/math/challenge.php>