Challenge of the Week

Challenge of the Week # 10 - November 6 to November 13, 2009

A positive integer A is called **increasing** if all of its decimal digits increase from left to right. Thus, 125 and 135689 are increasing, but 3529 is not.

1. Show that if A is an increasing positive integer, then the sum of the digits of $9A$ is exactly nine.
2. Show that if A is an increasing positive integer, then the sum of the digits of $99A$ is exactly 18.

Direct any questions concerning this week's challenge to Gregory Galperin, OM 3361

Rules and Awards

- 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 (OM3611) by 2:00 p. m., Friday, November 13.
- Entries will be graded on the basis of clarity of exposition and elegance of solution.
- An award of $20 will be given for the best solution. In the case of a two-way tie, the award will be split. If there are more than two 'best' solutions, a drawing will be held for the award. In case no award is made for this week's challenge, $20 will be added to the next week's award.
- Names of all solvers will be posted on the Challenge of the Week bulletin board and on the Challenge of the Week homepage: http://www.ux1.eiu.edu/~dmbroline/chalweek/index.html