University Math Challenge

PROBLEM # 1

(1) If ABC is a triangle whose largest angle is less than 70°, must it be true that the smallest angle of the triangle is greater than 40°? Explain your answer.

(2) If DEF is a triangle whose smallest angle is greater than 40°, must it be true that the largest angle of the triangle is less than 70°? Explain your answer.

(3) If XYZ is a triangle whose largest angle is greater than 70°, must it be true that the smallest angle of the triangle is less than 40°? Explain your answer.

(4) If UVW is a triangle whose smallest angle is less than 40°, must it be true that the largest angle of the triangle is greater than 70°? 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, October 31st, 2025.

- 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 $75 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, $75 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`