University Math Challenge

PROBLEM # 2

A slot machine accepts blue and orange tokens. For each token it is given, it gives back tokens of the other color. A player begins with one blue token.

(1) If the machine always returns **three** tokens of the other color, is it possible for the player to reach a situation where they have the same number of tokens of each color? (Assuming they cannot discard tokens.) Explain your answer.

(2) If the machine always returns **two** tokens of the other color, is it possible for the player to reach a situation where they have the same number of tokens of each color? (Assuming they cannot discard tokens.) 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, December 6th, 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`