

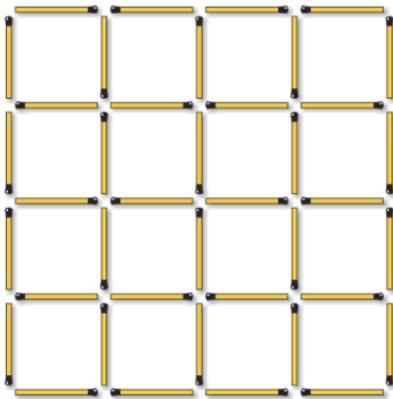
Math Auction 2

Rules of the game

1. We will divide into teams of 4-5 students each and work on the problems below for the first 40 minutes. *Note: We want students to work together in coming up with the answers, so parents please don't give away answers.*
2. Each time is given starting money of \$1000. (we will keep track of \$ on the board)
3. The best solution to a problem is worth \$200.
4. The way the auction works is this:
 - a. The problem is put up for auction, where each team will bid \$ to present their answer (in increments of \$10). Each team will have a leader who is responsible for bidding for their team.
 - b. The team with the highest bid is allowed to present their solution to the class. One person from their team goes up to the board to share their answer. *Note: Each team member is only allowed to present 1 answer to a problem, then they must let each of their team members present an answer before going up again.*
 - c. The problem is put up for auction again, however this time the solution must be better than the previous solution (we will describe what 'better' means below)
 - d. If a team presents a better solution, they would get \$200 *instead* of the first team.
 - e. We keep auctioning & presenting solutions until there are no better solutions. The team with the best solution gets \$200 added to their balance.
5. We're going to start with problem 1, go through the steps mentioned above, then move onto problem 2.

Problems

1. Forty matches are arranged in the pattern below, forming many squares, including squares of size 1 x 1, 2 x 2, 3 x 3, and 4 x 4. Remove the fewest number of matches possible so that none of these squares remain.

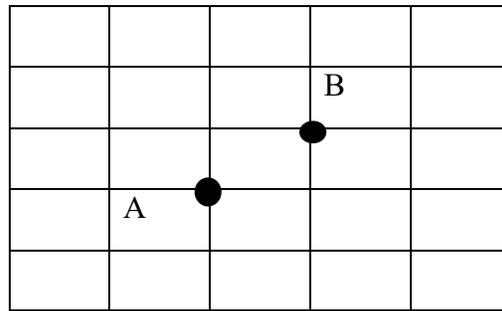


A team has a stronger solution for this problem if it is able to remove fewer matches.

- Find as many solutions as possible for the puzzle $BACK + BOA = SCAM$ (Equal letters stand for the same digits, and different letters for different digits).

A team has a stronger solution if they can find different solutions.

- A tourist wants to walk along the streets from point A to point B. He wants the route to be as long as possible, but without visiting the same intersection twice, since this is boring. Draw the longest route on the map.



A team has a stronger solution if they can find a longer route.

- (This problem is for fun and will not be a part of the auction!)** Express the number 100 using several copies of number 1, four arithmetic operations (+, −, ×, ÷) and parenthesis. Use as few copies of 1 as possible. (Do not combine 1's into multi-digit numbers such as 11 or 111.) Example: the solution $100 = 1+1+1\dots+1$ uses 100 ones.

A team has a stronger solution for this problem if it is able to continue the list starting from where the previous team stopped.