Dear Math students,

Your financial advice is most appreciated. I am currently shopping for a house in my price range in the Chicago-land area. As a part of my job at International Enterprises, I am organizing an advertising campaign for one of our clients. I have run into some trouble with this, so I once again am turning to you for help.

The restaurant chain Chicken Licken has asked our company to write and design their new ads. They offer a deal where for $8.95 the customer chooses one of five main courses: a chicken sandwich, a chicken breast, a chicken pot pie, chicken sticks, or vegetarian lasagna. With each meal, the customer also has the choice of two sides dishes. The restaurant offers french fries, mashed potatoes with gravy, baked potatoes, hash browns, bread, salad, soup, biscuits, cottage cheese, or fruit. In total, there are ten side dishes. The meal also comes with a dessert. There are four options: pie, ice cream, cake, or cookies. As part of the ad, the company wanted to know the number of different possible meals. After consulting a book, I calculated that there were 1800 possible meals, which seemed like a nice number to use for advertising.

I told a friend about my project and she said that she had read an article (“Teacher’s Diligence Finds Fame, Free Lunch,” The Morning Call (Allentown, PA), Jan. 21, 1995, Joseph P. Ferry) about how Boston Chicken (now Boston Market) had run a similar ad and miscalculated the number of possible meals. Apparently they offered sixteen side dishes and the customer was allowed to choose three of them with each meal. The company’s ad (featuring legendary quarterback Joe Montana) claimed that there were 3,360 possible combinations of three side dishes chosen from the sixteen offered. A high school mathematics teacher, Bob Swaim, convinced them that they had made a mistake. He and thirty of his students received a free lunch from Boston Chicken. He also appeared on the CBS program “Good Morning America.” The teacher argued that whoever had done the mathematics had confused the concepts of permutations and combinations. By his calculations, there were only 816 different combinations available. He also noted that the ad did not allow for the possibility of choosing a side dish more than once and that his formula did. After hearing about this, I began to question the calculations that I had made. I don’t want to be embarrassed by having the same thing happen to Chicken Licken.

Since you are studying under the guidance of Professor Tweddle, I have every faith in your abilities to help me out. I need to know how many possible meals there are. I would also appreciate it if you could tell me how Boston Chicken and Bob Swaim arrived at their different answers. Thanks for all your help. Since we’d like to start this ad campaign as soon as possible, please respond by Monday, April 6.

Yours sincerely,

J.R. Doe
International Enterprises