Name: Section:

MATH 1001, Fair Division Quiz, Spring, 2003
Remember, there will be little or no partial credit given on questions in this quiz.

TRUE/FALSE (2 points each) Answer the following questions by writing a T or F in the blank.

___T___ 1. If I split a cake with somebody using the "You Cut/I Choose" method, it is possible that my fair share will be worth more than 50% to me.

Look in your book: the chooser might get a piece worth more than 50% to her.

___T___ 2. Whether or not my piece of a cake is a a fair share only depends on my perceptions, and not what any other player thinks about my piece.

___T___ 3. In the Lone Chooser method, with 3 players, the cake will be split into 6 pieces before the Chooser actually chooses anything.

___F___ 4. 10 players are splitting a cake using the Last Diminisher method, and it is $P_4$'s turn during the first round. If $P_4$ thinks the current piece is worth exactly 10%, then she will choose to play, cut off a slice, and claim the new C-piece. (Think carefully here!)

If $P_4$ chooses to play, he has to cut off part of the C-piece, which would make it worth less than 10%, so it wouldn't be a fair share anymore.

___F___ 5. If there are *four* players sharing a cake, then a "fair share" for a player is any piece that she thinks is worth at least $33\frac{1}{3}\%$ of the total cake.

100% divided by 4 players is 25%.

5. My son and two nephews split a cupcake using the Lone Divider method. The Divider cuts three pieces, $s_1$, $s_2$, and $s_3$. The following table shows how much each piece is worth to each player.

| | $s_1$ | $s_2$ | $s_3$ |
|---|---|---|---|
| $D$ | $33\frac{1}{3}\%$ | $33\frac{1}{3}\%$ | $33\frac{1}{3}\%$ |
| $C_1$ | 20% | 20% | 60% |
| $C_2$ | 20% | 40% | 40% |

Write down $C_1$'s bid and $C_2$'s bid. (2 Points)

$$C_1 : \{s_3\}$$
$$C_2 : \{s_2, s_3\}$$

Describe a fair division of the cupcake. (3 Points)

$D$ gets $s_1$
$C_1$ gets $s_3$
$C_2$ gets $s_2$