Test 2 Topics

Fair division (80%)

- Fair share
- Lone divider method
- Method of markers
- Method of sealed bids

Apportionment (20%)

- Standard divisor and standard quota
- Hamilton's method
- Quota rule
- Paradoxes
  - Alabama paradox

Review Session

Monday, October 16,
7:00 PM,
EB 145

Fair Share

Suppose n people are to divide a good equally among them into n pieces. A **fair share** is a piece that **in the opinion of the person receiving** it is worth 1/n of the total value of the good.

Declaration Step in Long Divider Method

Table 2.1				
Player \ Slice	S_1	S_2	S_3	S_4
A	32%	20%	24%	24%
B	25%	25%	25%	25%
C	25%	15%	30%	30%
D	26%	26%	26%	22%

Which player is the divider?

What should each chooser's ***declaration*** be?

Long Divider Method: Conflict Resolution

Table 2.3	Declaration
Chooser 1	$\{s_1, s_3\}$
Chooser 2	$\{s_3\}$
Chooser 3	$\{s_2, s_5\}$
Chooser 4	$\{s_1, s_3\}$

Can all pieces be distributed?
What players can be satisfied, and which are involved in the next stage?
What is the cake for the next stage?

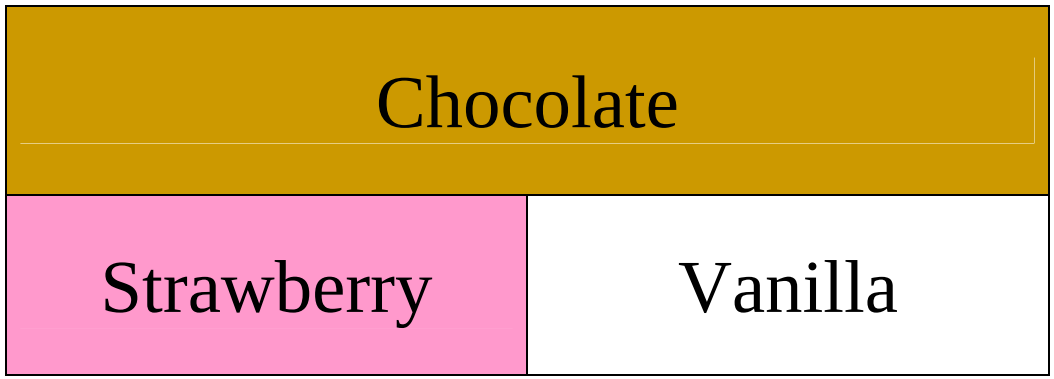
Method of Markers: Marking

Four players (A, B, C, and D) agree to divide some candy by the method of markers. Assume that you are player A and that you like Reese's Pieces (denoted R, below) twice as much as plain M&Ms (denoted M) or peanut M&Ms (denoted P). Place your markers below so that you will be guaranteed to receive a fair share. [Hint: assign a numerical value to each piece.]

M P M P M R P M M P R P M P R M M R P M M R M P M R

Dividing a Cake: Being the Divider

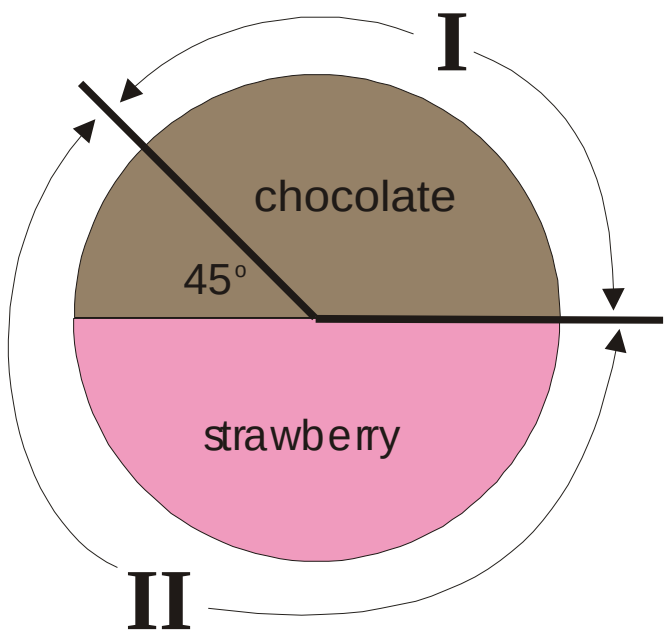
You and two friends buy a rectangular cake, shown below. The cake is 1/2 chocolate, 1/4 strawberry, and 1/4 vanilla. You decide to divide it among the three of you by the lone divider method. You are the divider. You like strawberry just as much as vanilla, and you like vanilla twice as much as chocolate. Make cuts of the cake into the appropriate number of pieces so that you will receive a fair share. Label the pieces carefully.



Dividing a Cake: Values

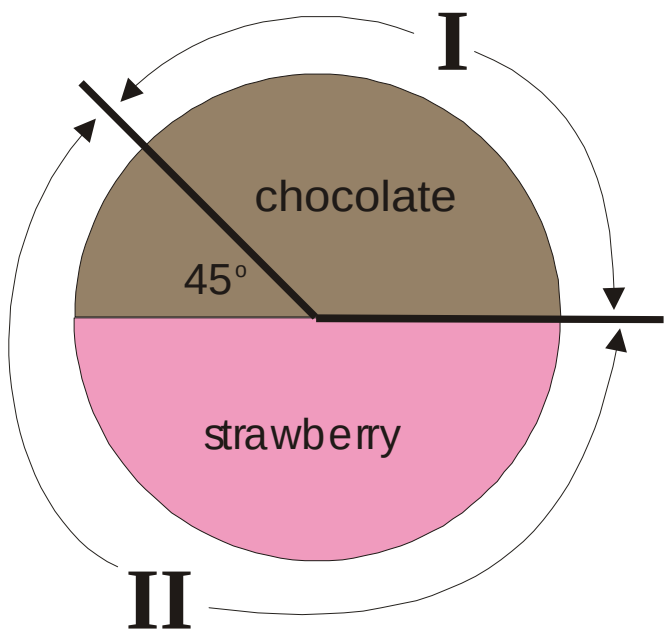
Ted and Carol buy a half-chocolate, half-strawberry cake for $12.00. They want to divide it by the divider-chooser method. Ted likes chocolate twice as much as strawberry.

What is the value of the chocolate half of the cake to Ted? What is the value of the strawberry half of the cake to Ted?



Carol likes strawberry three times as much as chocolate.

What is the value of the chocolate half of the cake to Carol? What is the value of the strawberry half of the cake to Carol?



Suppose Ted is the divider and cuts the cake as shown into pieces I and II. Show that pieces I and II are of equal value to Ted.