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Of course Charles chooses \tilde{S}_2 , which is worth $\frac{7}{9}$ of the total value of the pizza to him!

Dan and Clare walk away with what they see as $\frac{1}{2}$ the value.

We can formalize the steps of the Lone-divider method:

Step 0: Decide which player of the 3 will be the divider (via a coin toss or something).

Step 1: (Division) Call the divider D. Have D divide the assets into 3 shares of equal value (to D).

Step 2: (Bidding) Call the other two players C_1 and C_2 . Have C_1 and C_2 list all the shares that they consider fair to them.

Step 3: (Distribution) Now we try to distribute (9) the shares fairly. We separate the pieces into two types:

C-pieces: these are pieces for which "at least" one of the choosers C_1, C_2 values $\frac{1}{3}$ or more.
(C is for "chosen")

U-pieces: these are all the pieces that are not C-pieces. A U-piece is a piece that neither of the choosers values as fair.
(U is for "unwanted")

The distribution of pieces goes by cases.

Case 1: When there are two or more C-pieces, we can fairly distribute the pieces.

Case 2: When there is only one C-piece, we first give D, the divider, one of the U-pieces, and then recombine the remainder and

(10) have C_1 and C_2 apply the divider-
chooser method to whatever remains.