

Lone-Chooser Method, worksheet 2.

Angela, Boris and Carlos decide to divide the cake below using the lone-chooser method.

The players value different parts of the cake as follows:

Angela likes strawberry three times as much as she likes vanilla.

Boris likes vanilla five times as much as he likes strawberry.

Carlos likes vanilla twice as much as he likes strawberry.

(a) Suppose the cake is worth \$12. For each player, label the value of each half of the cake below.

Angela:

Boris:

Carlos:

(b) Suppose Angela and Boris are the dividers and Angela makes the first cut vertically through the center of the cake. Suppose Boris picks the right half. Draw a possible second division of the cake that Angela might make on the left half of the cake.

(c) Draw a possible second division that Boris might make on the right half of the cake.

(d) Based on the second divisions of Angela and Boris in (b) and (c) describe a possible fair division of the cake.

(e) For the final fair division you found in (d), find the total value of each share (as a percentage of the total cake) in the eyes of the player receiving that share.

(f) Now, suppose the same cake is to be divided and Angela makes the first, but she decides NOT to make a vertical cut as her first cut. Draw below another possible first cut that Angela might make.

(g) Assuming Angela makes the cut in (f) which half would Boris choose? Draw a possible second cut that Boris might make on his selected portion of the cake.

(h) Draw a possible second cut that Angela might make on her remaining portion of the cake.

(i) Based on the second divisions of Angela and Boris describe a fair division of the cake. Which pieces would Carlos choose and how much are his pieces worth to him?