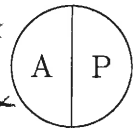
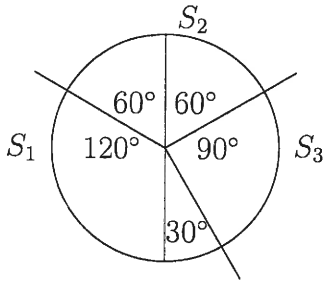
Name: Solutions

Quiz 7

Three people (B, C, and D) decide to use the Steinhaus method to divide a pie that is half apple and half peach (the apple is on the left, the peach is on the right).

B likes both apple and peach equally. x x
C likes apple and hates peach. 1 0
D like peach twice as much as apple x 2x





Suppose D divides the pie as pictured (you can assume D divides the pie into 3 equal pieces in D's value system).

Calculate the value of each piece of B and C, and fill in the table below with the fraction of the whole pie each piece represents. Then fill in the bid lists.

	A	P
B:	x	x
C:	1	0
D:	x	2x

To B: $S_1 = \frac{150}{360}$

$S_2 = \frac{120}{360}$

$S_3 = \frac{90}{360}$

To C: $S_1 = \frac{120}{180}$

$S_2 = \frac{60}{180}$

$S_3 = 0$

	S_1	S_2	S_3	bid lists
B	$\frac{150}{360}$	$\frac{120}{360}$	$\frac{90}{360}$	S_1, S_2
C	$\frac{120}{180}$	$\frac{60}{180}$	0	S_1, S_2
D	$1/3$	$1/3$	$1/3$	all

Specify a fair division that could result. Is this division envy-free? If not, who envies whom in this division?

B - S_1
C - S_2
D - S_3

C envies B

Specify another fair division that could result. Is this division envy-free? If not, who envies whom in this division?

B - S_2
C - S_1
D - S_3

B envies C