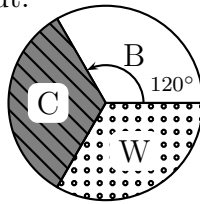
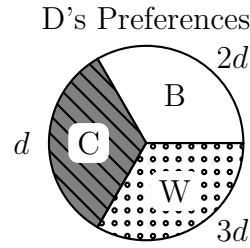
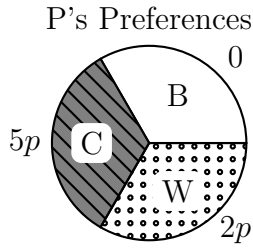


1. Suppose two people, Peter (P) and Dina (D), wish to share the following cake which is $\frac{1}{3}$ Chocolate (C), $\frac{1}{3}$ Blueberry (B) and $\frac{1}{3}$ Walnut:



Suppose their preferences are as follows:

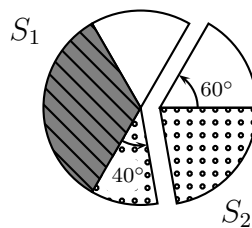


Fill in the following table with their valuations of the different components:

	C	B	W
P			
D			

Suppose they decide to use **I cut, you choose** to divide the cake where D is the cutter and P is the chooser. Justify all your answers below.

- (a) Verify that D could cut as follows.



- (b) What does P think each slice is worth?

	S_1	S_2
P		

- (c) List the division that could result from using **I cut, you choose** with the cut given above by listing the slice each of P and D receives in the blanks below.

P : _____

D : _____

- (d) Is the division envy-free?

- (e) Is the division equitable?

- (f) Is the division Pareto optimal?

2. Suppose 2 housemates Adam (A) and Bob (B), who are moving out, wish to share a DVD collection of 12 DVDs consisting of 3 types:

- 2 Romance DVDs (R)
- 4 Horror DVDs (H)
- 6 Comedy DVDs (C)

We will represent the DVDs in the following diagram where one small square represents 1 DVD (all small squares are identical in area):

H	R	R
H	C	C
H	C	C
H	C	C

A and B 's preferences for the different types of DVDs are as follows:

- A likes all 3 types of DVDs equally.
- B likes Romance and Comedy DVDs equally but likes Horror twice as much as he likes either of the others.

(a) Fill in the charts below with A and B 's preferences given that:

a = the amount that A values 1 Comedy DVD

b = the amount that B values 1 Comedy DVD

A 's preferences:

total = _____ a

B 's preferences:

total = _____ b

(b) Fill in the following table with their valuations of the different components:

	H	R	C
A			
B			

(c) Suppose A and B want to share the DVDs using the method of I cut, you choose where B cuts and A chooses. Answer the following questions.

i. In which of the following ways might B cut? Circle all that apply.

I. S_2

H	R	R
	C	C
H		C
H	C	
H	C	C

S_1

II. S_2

	R	R
H	C	C
H	C	C
H		C
H	C	

S_1

III. S_2

H	R	R
H	C	C
H	C	C
H	C	C
H	C	C

S_1

IV. S_2

H	R	R
H	C	
	C	C
H		C
H	C	C

S_1

ii. Suppose B cuts as follows:

			S_1
	H	R	R
		C	C
H		C	C
H			
H	C	C	
			S_2

iii. What does A think each slice is worth?

	S_1	S_2
A		

iv. List the division that could result from using **I cut, you choose** with the cut given above by listing the slice each of A and B receives in the blanks below. This will be your **original division**.

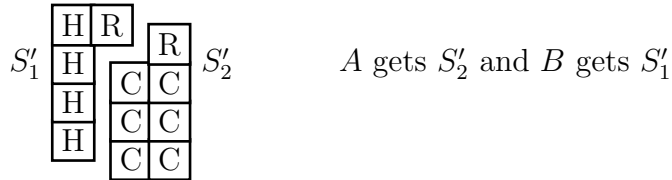
A : _____ (A 's share) = _____

B : _____ (B 's share) = _____

v. Is the division envy-free?

vi. Is the division equitable?

vii. Consider the **alternative division** below.



A. Fill in the following table with their valuations of the slices in the **alternative division** above:

	S'_1	S'_2
A		
B		

B. Identify each person's share in this alternative division.

(A 's share) = _____

(B 's share) = _____

C. Is this alternative division an objective improvement over the original division?

Circle One: Yes No

Please Explain.