A Note on How to transfer a data set to PPF

In our study plan and assignment of Chapter 3, you will see the following question:

The people of Leisure Island have 50 hours of labor a day (i.e., L = 50) that can be used to produce entertainment (Q_E) and good food (Q_f).

The table shows the maximum quantity of either entertainment (Q_E) or good food (Q_f) that Leisure Island can produce with different quantities of labor (L).

>>> Answer to 1 decimal place below.

Labor (L)	Entertainment (Q_E)		Good Food (Q_f)
0	0	or	0
10	80	or	120
20	160	or	200
30	240	or	240
40	320	or	260
50	400	or	268

To convert this table to a PPF, first, we should know that L = 50 that can be used to produce Q_E or Q_f. In order to produce a certain amount of Q_E, we use L_E and a certain amount of Q_f, we use L_f. Hence, we can write L = 50 = L_E + L_f. Apply this information to the table, we get PPF as:

(1)	(2)	(3)	(4)
L_E	Q_E	L_f	Q_f
50	400	0	0
40	320	10	120
30	240	20	200
20	160	30	240
10	80	40	260
0	0	50	268

Note that Col (1) + Col (3) = L_E + L_f = 50 and Col (2) and Col (4) is PPF of Leisure Island.

Now, we are ready to answer the following four questions:

1. When Leisure Island produce 80 units of entertainment (Q_E = 80) and 200 units of food (Q_f = 200), the opportunity cost of producing an additional unit of entertainment is <u>0</u> units of food. *This is due to (Q_E = 80 and Q_f = 200) is inside PPF.*

2. When production is 160 units of entertainment and 240 units of food a day, the opportunity cost of producing another unit of entertainment is <u>0.5</u> units of food, i.e.,

$|\Delta Q_f/\Delta Q_E| = |(200 - 240)/(240 - 160)| = |-40/80| = 0.5.$

3. When production is 240 units of entertainment and 200 units of food a day, the opportunity cost of producing another unit of entertainment is _1.0_ units of food, i.e.,

$|\Delta Q_f/\Delta Q_E| = |(120 - 200)/(320 - 240)| = |-80/80| = 1.0$.

4. The opportunity cost of producing a unit of entertainment _increases_ as more entertainment is produced.

From our answers in 2 and in 3, we can see that $\Delta Q_E = 240 - 160 = 80$, i.e., $Q_E \uparrow$ (more entertainment is produced), $|\Delta Q_f/\Delta Q_E| = 1 > |\Delta Q_f/\Delta Q_E| = 0.5$, i.e., the opportunity cost of producing additional unit of entertainment increases, or $|\Delta Q_f/\Delta Q_E| \uparrow$.