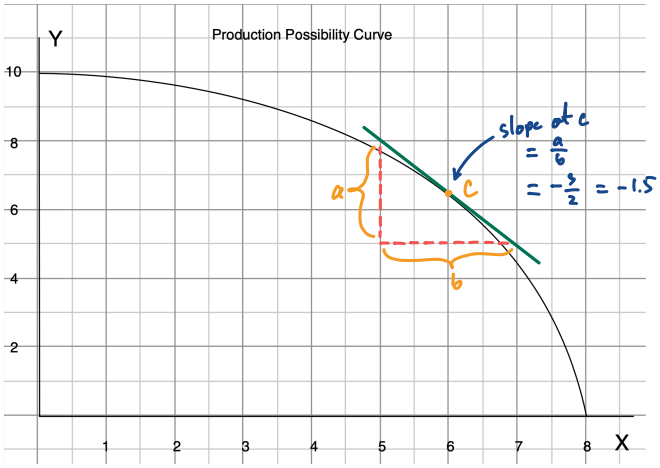
HW Nonlinear PPC



the opp. cost per unit of $y = \frac{b}{a} = -\frac{2}{3} = -0.67$

a) Find the opportunity cost of each additional unit of y in terms of units of x

y	x	Opp. Cost of y
0	8	
1	7.9	= 0.1 loss of x
2	7.7	= 0.2 loss of x
3	7.4	= 0.3
4	7.2	= 0.2
5	6.8	= 0.4
6	6.3	= 0.5
7	5.6	= 0.7
8	4.7	= 0.9
9	3.4	= 1.3
10	0	= 3.4

b) Is the opportunity cost of y increasing? yes, the opp. cost of y is increasing as more of y increased.

c) Compute the opportunity cost per unit of y when $x = 6$. Given that $x = 6$ is at point C, opportunity cost of $y = 0.67$ units of x per unit change of y

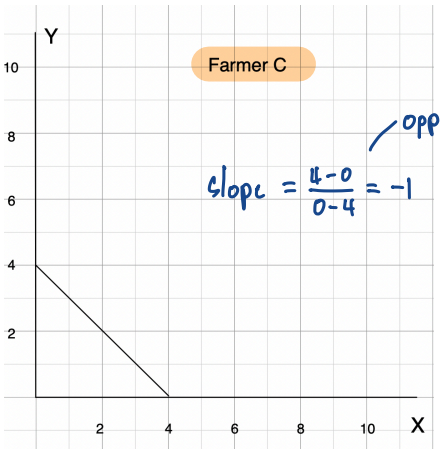
d) At $x = 6$, approximate how much more x can be produced if we have y less by 0.2 units. At $C = (6, 6.5)$, $\Delta y = -0.2$

$$\Delta x \approx \frac{\Delta y}{(\text{slope at } C)}$$
$$= \frac{-0.2}{-1.5}$$
$$= 0.13$$

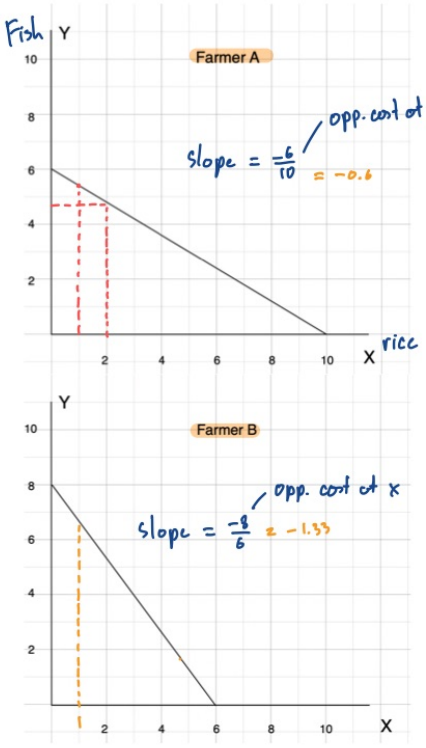
∴ If we decrease y by 0.2 units, we have 0.13 unit less of x (approximately)

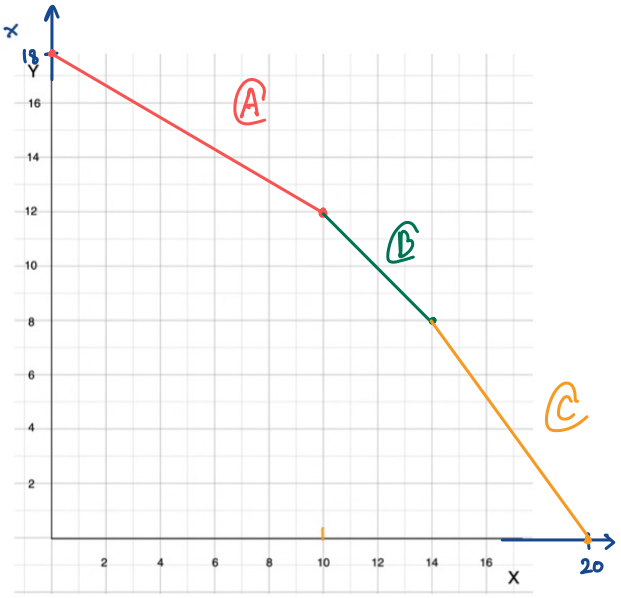
Can a PPC have positive slope?

HW Farmer C has the PPC given below. Find the PPC of all three farmers A, B and C combined.



Example There are two farmers A and B who produce X = rice and Y= fish, each having a constant PPC as given.

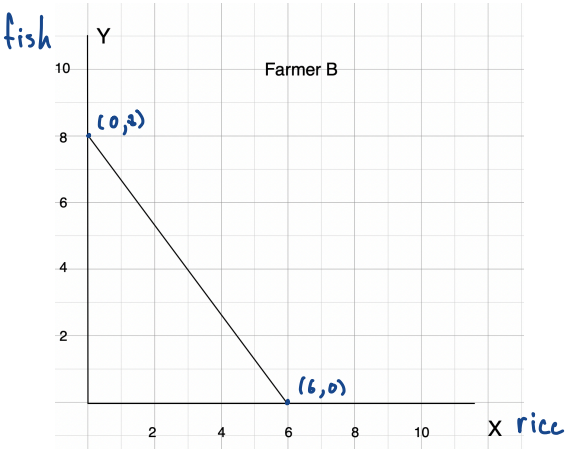




X	Y	
0	18	} -0.6
1	17.4	
2	16.8	
3	16.2	
4	15.6	
5	15	
6	14.4	
7	13.8	
8	13.2	
9	12.6	
10	12	
11	11	} -1
12	10	
13	9	
14	8	
15	6.67	} -1.33
16	5.34	
17	4.01	
18	2.68	
19	1.35	
20	0	

We can find the PPC of the combined resources of both farms.

HW. If a new fertilizer is found to double the output of rice (x) for any level of production of fish (y), how will PPC of farmer B change? Does the opportunity cost of x increase? Does the opportunity cost of y increase?

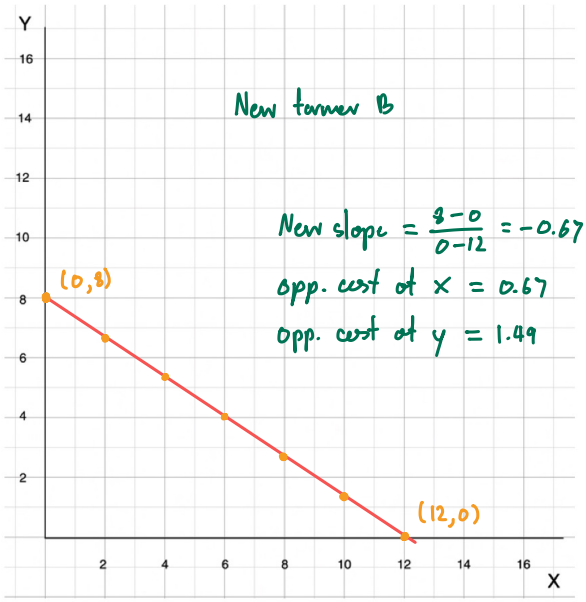


$$\text{Slope} = \frac{8-0}{0-6} = -\frac{8}{6}$$
$$= -1.33$$

Opp. cost of x = 1.33

Opp. cost of y = $\frac{1}{1.33}$ = 0.75

New x	X	Y
0 ⇐	0	8
2 ⇐	1	6.67
4 ⇐	2	5.34
6 ⇐	3	4.01
8 ⇐	4	2.68
10 ⇐	5	1.35
12 ⇐	6	0



New slope = $\frac{8-0}{0-12}$ = −0.67

opp. cost of x = 0.67

opp. cost of y = 1.49

∴ the opportunity cost of x decrease from 1.33 to 0.67
the opportunity cost of y increase from 0.75 to 1.49