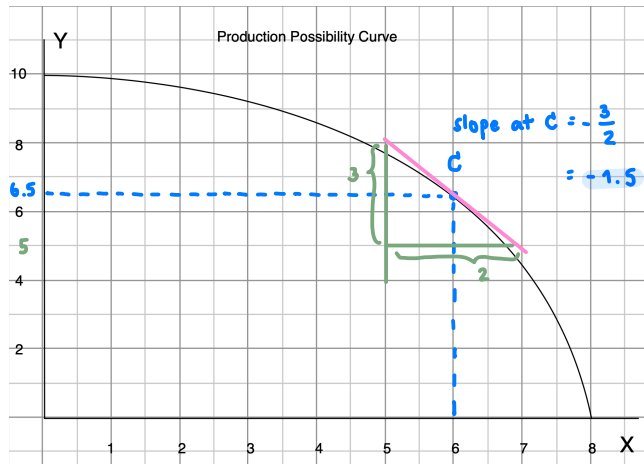


HW Nonlinear PPC



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

y	x	Opp. Cost of y - when y increases 1 unit at a time
0	8	
1	7.9	$= 0.1$ less of x
2	7.7	$= 0.2$ less of x
3	7.4	0.3
4	7.1	0.3
5	6.7	0.4
6	6.3	0.4
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**
c) Compute the opportunity cost per unit of y when $x = 6$. **at point C**
d) At $x = 6$, approximate how much more x can be produced if we have y less by 0.2 units.

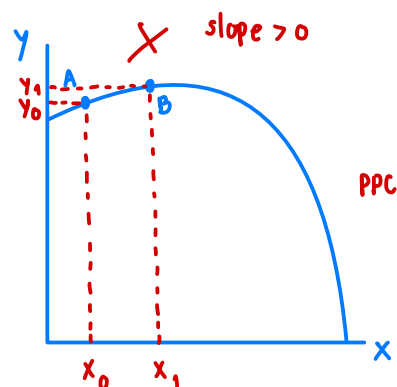
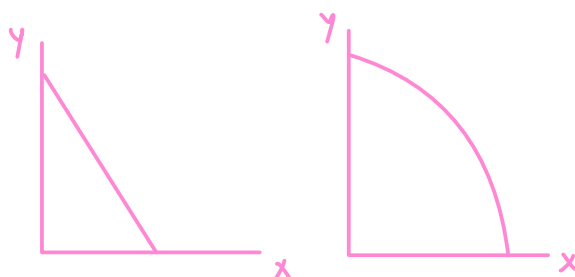
$$\frac{1}{-1.5} \approx -\frac{2}{3} \approx -0.67 \text{ opp cost of } y$$

$$\Delta y = -0.2$$

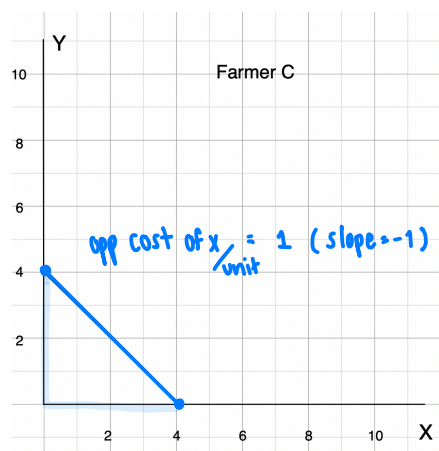
$$\rightarrow \Delta x \approx \frac{\Delta y}{\text{slope at } C} \approx \frac{-0.2}{-1.5} \approx 0.13$$

- approx 0.13 unit more of x

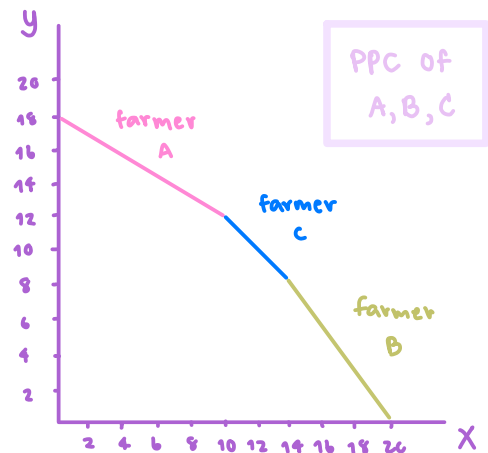
Can a PPC have positive slope?



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

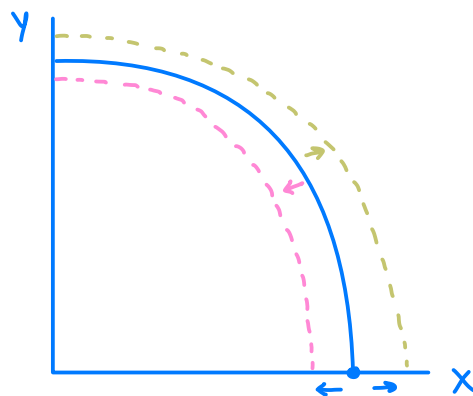


X	y
0	18
1	17.4
...	...
10	12
11	11
...	...
14	8
15	6.67
...	...
20	0.02



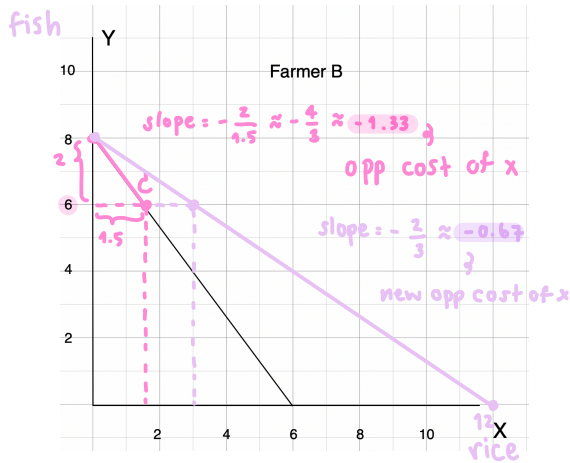
Change in PPC - fix resources, fix technology, most efficient

1. COVID-19



2. Improvement of Technology of producing both x and y .

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?



At point C (1.5, 6), $\Delta X = 2$

$$\Delta y \approx (\text{slope at C}) \cdot \Delta x$$

$$\approx (-1.33)(2)$$

$$\approx -2.66$$

$$\frac{1}{-1.33} = -0.75 - \text{opp cost of y}$$

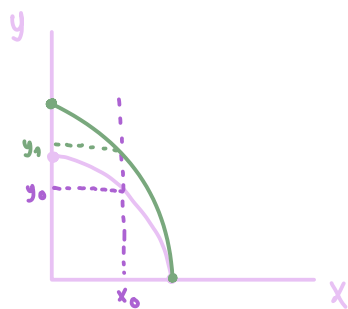
$$\frac{1}{-0.67} = -1.49 - \text{new opp cost of y}$$

$\therefore$ The opp cost of x decreases, but
the opp cost of y increases.

1 more unit of $y \Rightarrow 0.67$ unit less of x

1 more unit of $x \Rightarrow 1.49$ units less of y

Problem



What if tech improve production of y
to be double at every output of x

at (x_0, y_0) $\left\{ \begin{array}{l} - \text{has opp cost of } x \text{ changes?} \\ - \text{has opp cost of } y \text{ changes?} \end{array} \right.$

(double)
At x_0 , y increases from y_0 to y_1 ,
since the improvement of technology.
The opp cost of x increases, but the
opp cost of y decreases.