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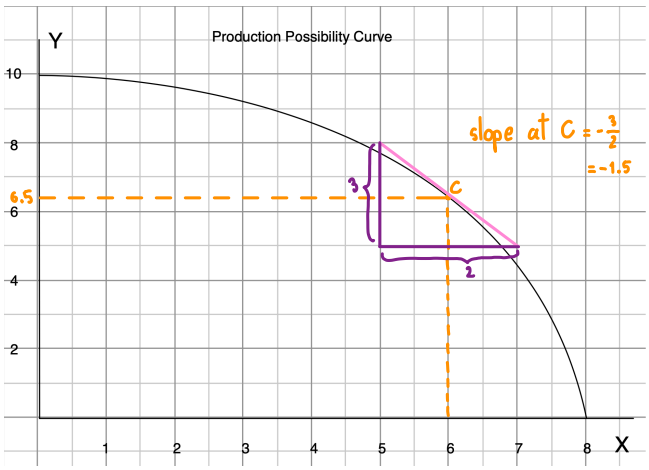
HW Nonlinear PPC



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

y	x	Opp. Cost of y
0	8	= 0.1 less of X
1	7.9	= 0.2 less of X
2	7.7	= 0.3 less of X
3	7.4	= 0.3 less of X
4	7.1	= 0.4 less of X
5	6.7	= 0.4 less of X
6	6.3	= 0.7 less of X
7	5.6	= 0.9 less of X
8	4.7	= 1.3 less of X
9	3.4	= 3.4 less of X
10	0	

c) $\frac{1}{-1.5} \approx \frac{-2}{3}$

≈ -0.67 Opp. cost of y

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

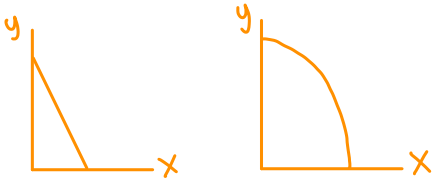
- approx 0.13 unit more of X

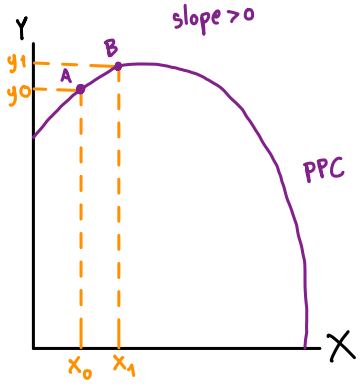
b) Is the opportunity cost of y increasing? Yes

c) Compute the opportunity cost per unit of y when $x = 6$. $\Delta y = -0.2$

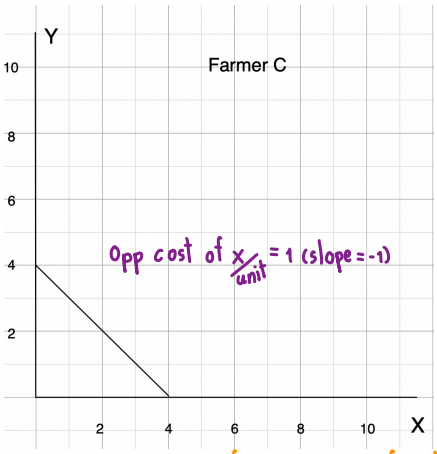
d) At $x = 6$, approximate how much more x can be produced if we have y less by 0.2 units.

Can a PPC have positive slope?

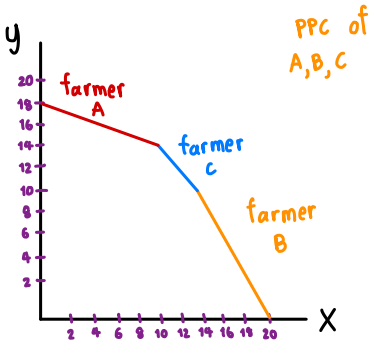




HW Farmer C has the PPC given below. Find the PPC of all three farmers A, B and C combined.

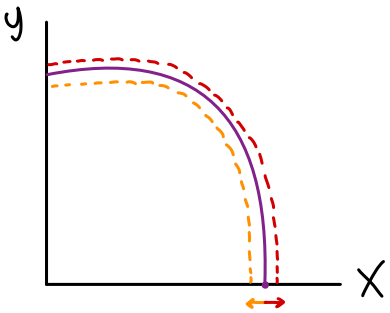


x	y	
0	18	A
1	17.4	
⋮	⋮	
10	12	
11	11	C
⋮	⋮	
14	8	
15	6.67	B
⋮	⋮	
20	0.02	



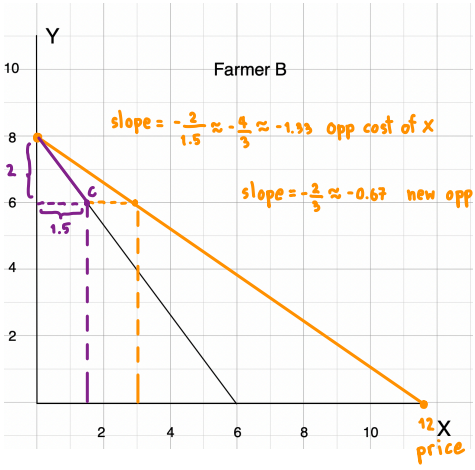
Change in PPC - fix resources, fix technology, most efficient

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 $(1.5, 6)$, $\Delta X = 2$

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

$\approx (-1.33)(2)$

≈ -2.66

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

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

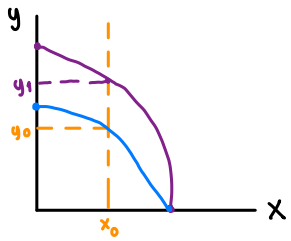
$\therefore$ Opp cost of x decrease.
Opp cost of y increase.

1 more unit of y → 0.67 unit less of x

1 more unit of x → 1.49 units less of y

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

at (x_0, y_0) { - has opp cost of x changes?
- has opp cost of y changes?



At x_0, y increase from y_0 to y_1 since the improvement of technology.

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