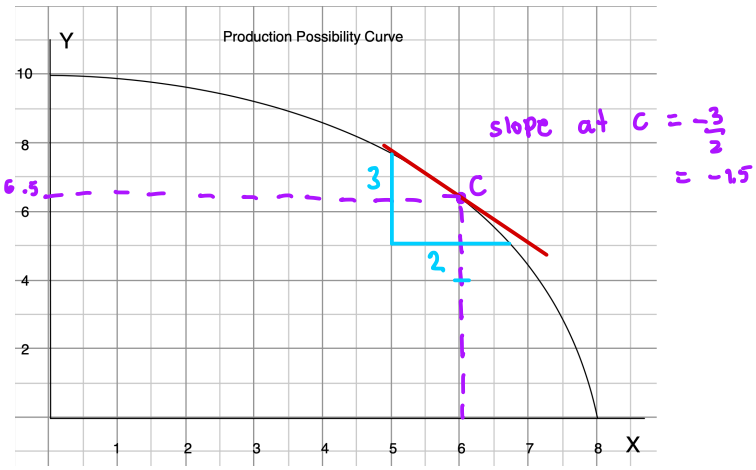
HW Nonlinear PPC



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	
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

when y increase 1 unit

b) Is the opportunity cost of y increasing? yes

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

$\frac{1}{-1.5} = \frac{-2}{3}$

≈ 0.67 opp cost of y

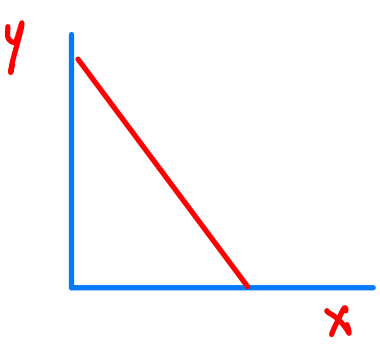
d) At $x = 6$, approximate how much more x can be produced if we have y less by 0.2 units.

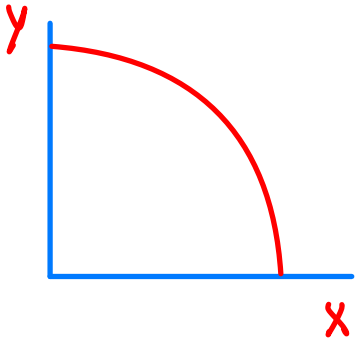
$\Delta y = -0.2$

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

- app x 0.13 unit more of x

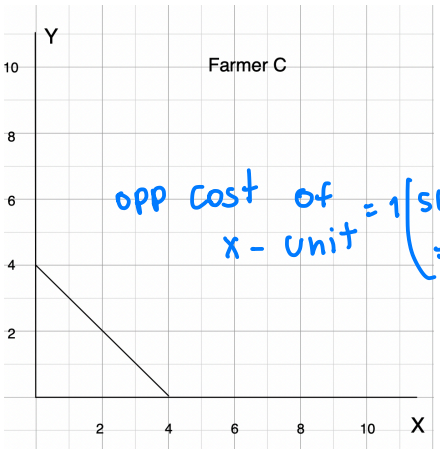
Can a PPC have positive slope?





— fixed resource, fix ~~~ y most efficient

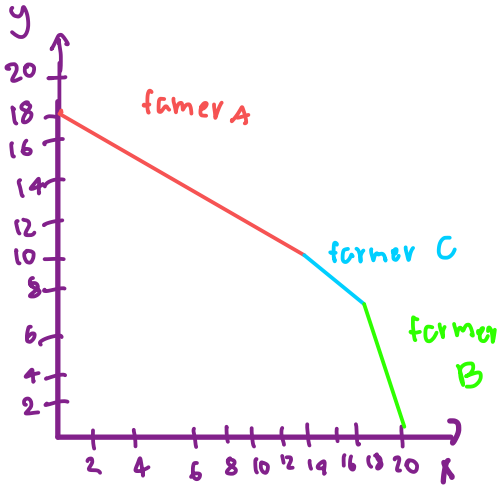
HW Farmer C has the PPC given below. Find the PPC of all three farmers A, B and C combined.



opp cost of x-unit = 1 (slope = -1)

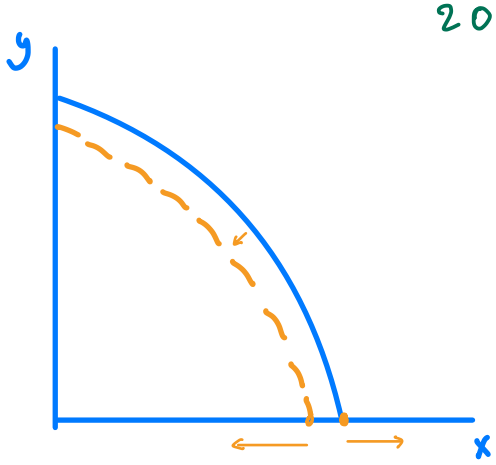
X	y
0	18
1	17.4
⋮	⋮
10	12
11	11
⋮	⋮
14	8
15	6.67
⋮	⋮
20	0.02

A C B

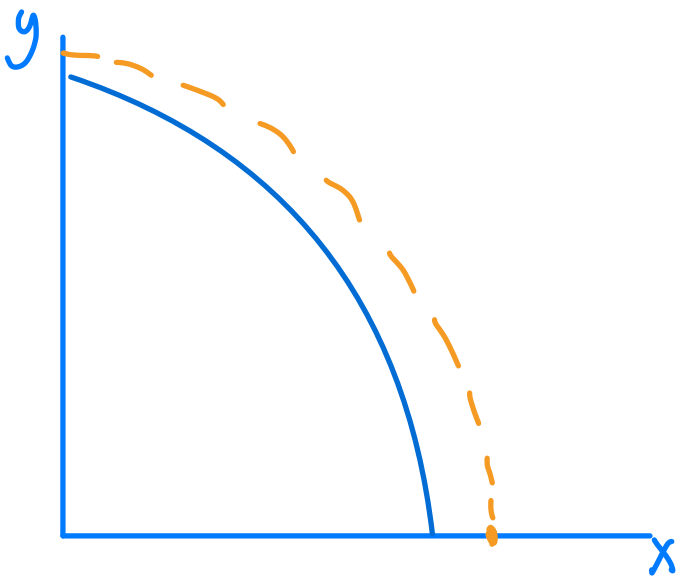


Change in PPC

1. COVID-19

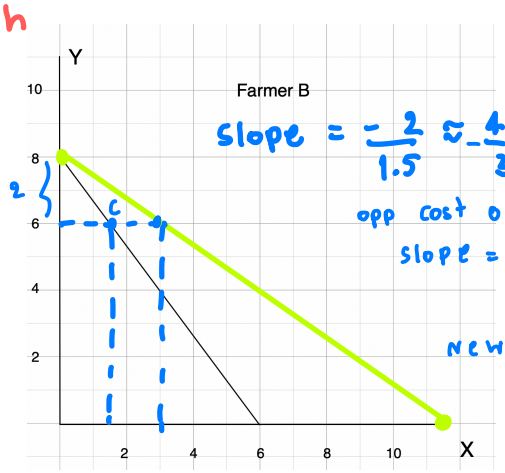


2. Improvement of Technology of producing both x and y.



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?

fish



Slope $= \frac{-2}{1.5} \approx \frac{-4}{3} \approx -1.33$

opp cost of x

Slope $= \frac{-2}{3} \approx -0.67$

≈ 7

new opp cost of x

rice

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

$\Delta y \approx$ (Slope at C) $\cdot \Delta x$

$\approx (-1.33)(2)$

≈ -2.66

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

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

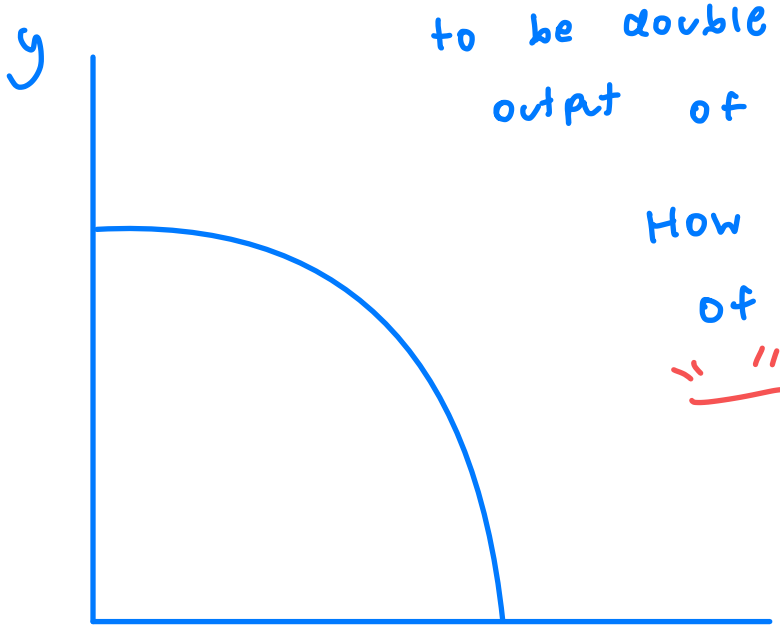
∴ the opp cost of x decrease, but the opp cost of y increase.

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

1 more unit of x

$\rightarrow 1.49$ units less of y

what is technology improve production of y to be double to every output of x



How opp cost of x chang ?
" y chang ?