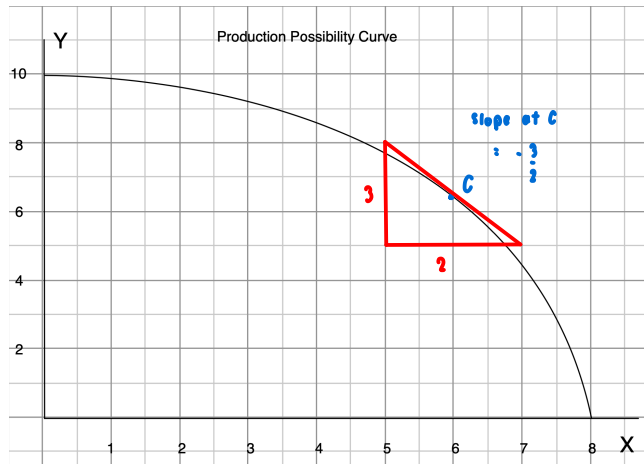


HW Nonlinear PPC



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	⋮
3	7.5	⋮
4	7.2	⋮
5	6.7	more and more
6	6.3	amount of x needs to
7	5.5	be lessen for each more
8	4.7	level of y
9	3.9	(increasing of opp. cost)
10	0	

b) Is the opportunity cost of y increasing? YES

c) Compute the opportunity cost per unit of y when x = 6. (point C)

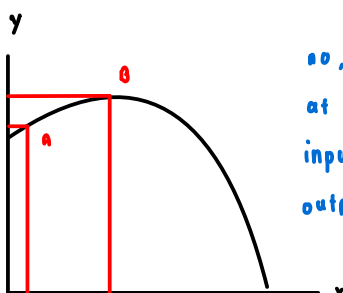
slope: -1.5 ⇒ opp. cost of x in terms of y 1 / slope: -0.67 : opp. cost of y in terms of x

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

$$\Delta y = -0.2 \quad \Delta x = \frac{-0.2}{-1.5} = 0.13$$

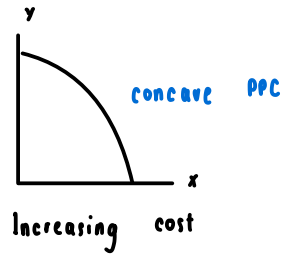
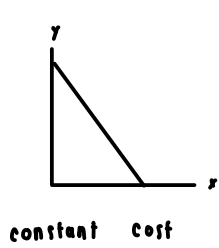
Can a PPC have positive slope?

∴ approximately more 0.13 of x



no, at point a and b, we have the same input but point b apparently have more output, which is impossible if the economy produce most efficiently at point a

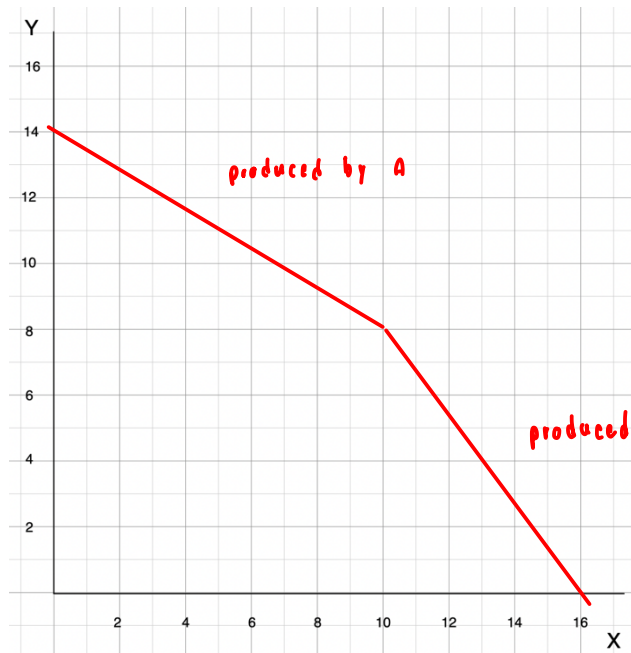
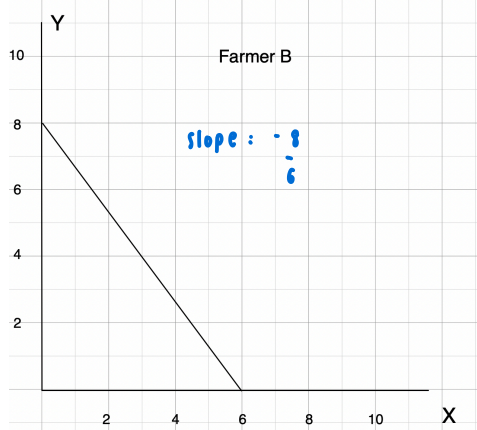
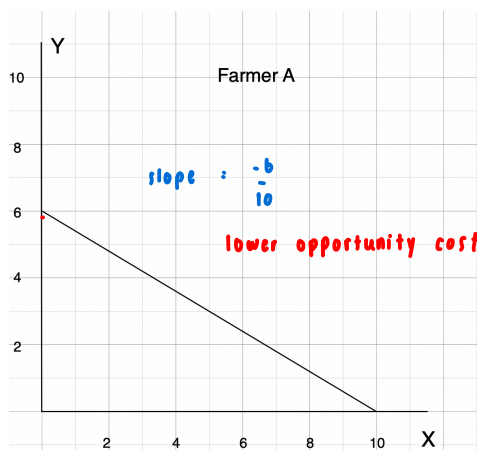
Nonlinear PPC: Decreasing Cost PPC



⇒ slope is increasing in absolute volume

- Most PPC are Increasing Cost

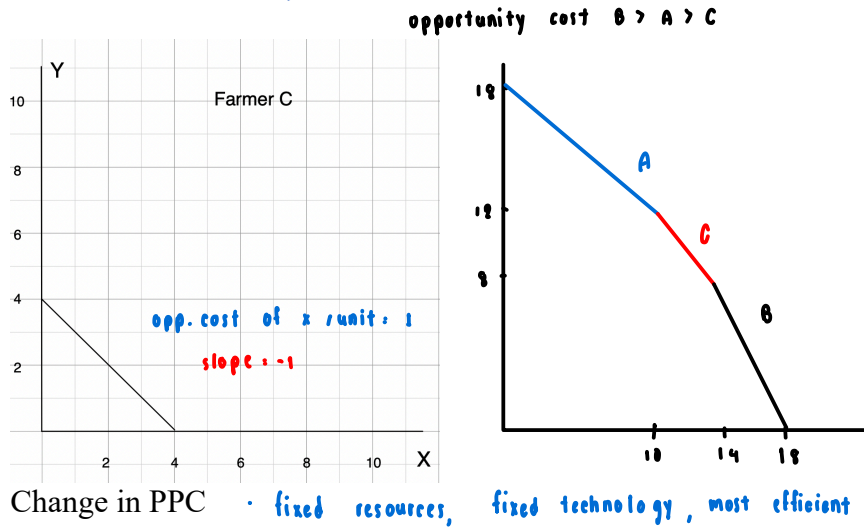
Example There are two farmers A and B who produce X = rice and Y= fish, each having a constant PPC as given.



x	y
0	14
1	13.4
2	12.8
3	12.2
4	
⋮	
10	8
11	6.67
12	5.33

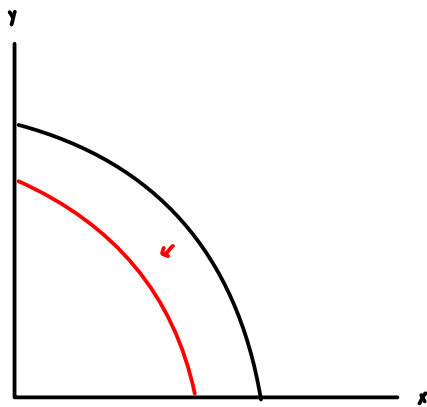
We can find the PPC of the combined resources of both farms.

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

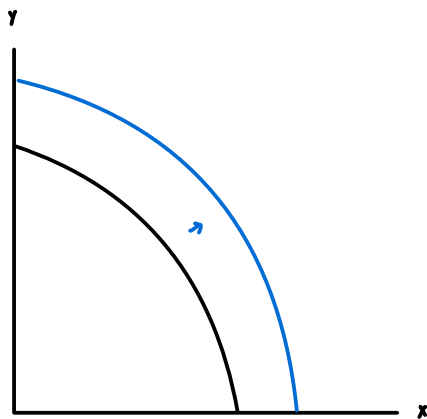


x	y
0	18
1	17.4
2	16.8
3	16.2
4	15.6
⋮	⋮
10	12
11	11
12	10
⋮	⋮
14	8
15	6.67
⋮	⋮
18	0

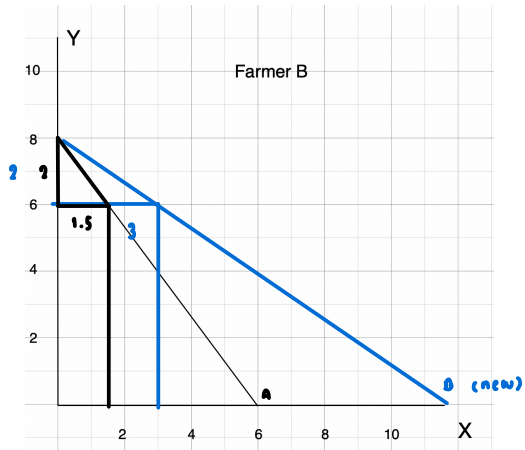
1. COVID-19



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?



$1.93 > 0.67$
 opp. cost decreases (x)
 if x increases 1
 y decreases 1.93
 if x increases 1
 y decreases 0.67
 Slope A : $-\frac{2}{1.5} = -1.33$: opp. cost of x
 Slope new : $-\frac{2}{3} = -0.67$: new opp. cost of x
 opp. cost of y : $\frac{1}{-1.33} = -0.75$ if y increases 1
 x decreases 0.75
 new opp. cost of y : $\frac{1}{-0.67} = -1.49$ if y increases 1
 x decreases 1.49
 if y increases 1 increases
 x decreases 1.49
 Ans : opp. cost of x decreases
 but opp. cost of y increases