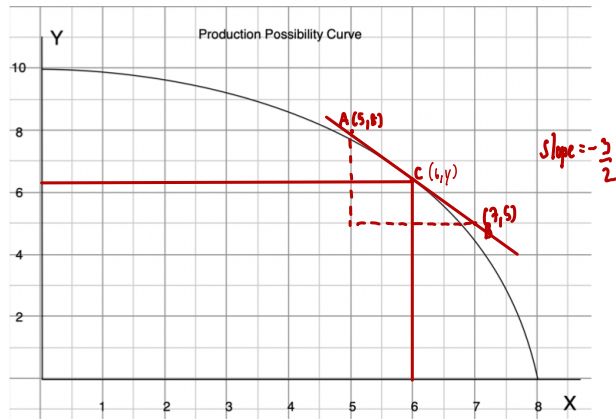


HW#4 Due Jan 27, 2022

HW Nonlinear PPC



$$Y = -1.5x + 12$$

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

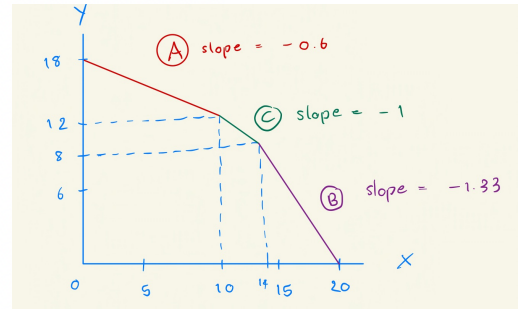
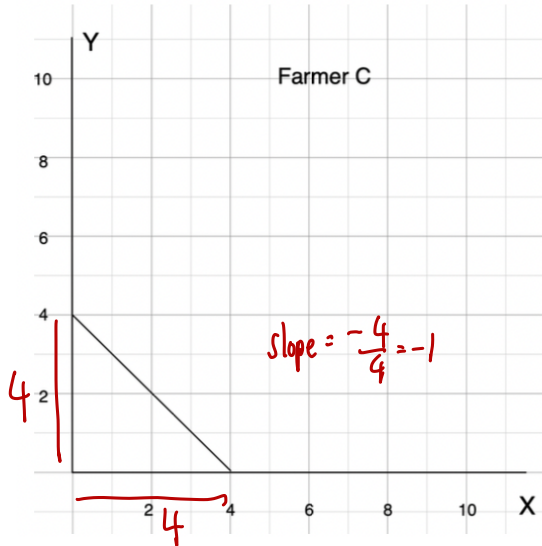
y	x	Opp. Cost of y
0	8	
1	7.9	0.1
2	7.7	0.2
3	7.4	0.3
4	7.1	0.3
5	6.7	0.4
6	6.3	0.4
7	5.6	0.7
8	4.7	0.9
9	3.4	1.3
10	0	3.4

- b) Is the opportunity cost of y increasing? Yes
- c) Compute the opportunity cost per unit of y when $x = 6$. Using tangent line at $x = 6$ to determine the slope at point C $\rightarrow \frac{1}{\text{slope}} = \frac{1}{-1.5} = -\frac{2}{3} = -0.67$ 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.

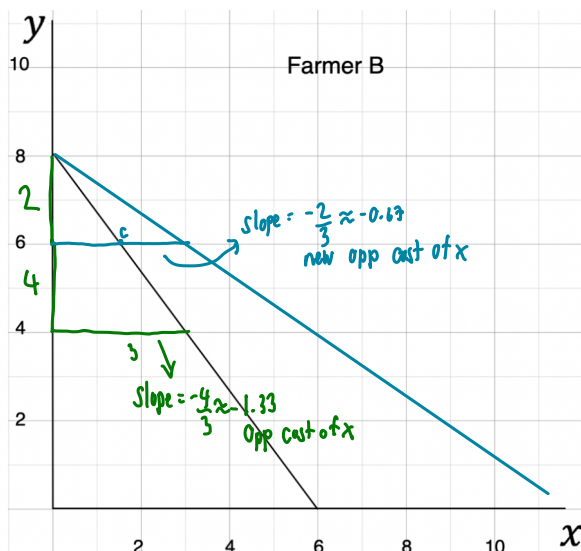
$$\Delta Y = -0.2$$

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

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



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?



Point C (1.5, 6) $\Delta x = 2$
 $\Delta x = 2$
 $\Delta y \approx (\text{slope at C}) \cdot \Delta x$
 $\Delta y \approx (-1.33) \times 2 \approx -2.66$

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

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

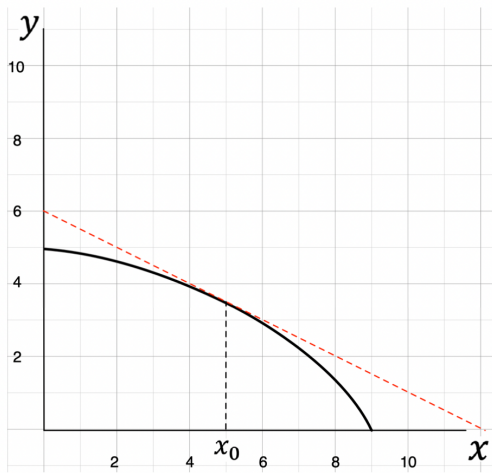
Hence, opp cost of x ↓
 opp cost of y ↑

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

1 more unit of $x \rightarrow 1.49$ less of y

HW. Given the PPC below,

- What is the opportunity cost of x at $x_0 = 5$?
- Suppose the technology of producing y improves so that the economy can double the output of y for any output level of x . Draw the new PPC.
- What is the opportunity cost of x at $x_0 = 5$ for the new PPC?

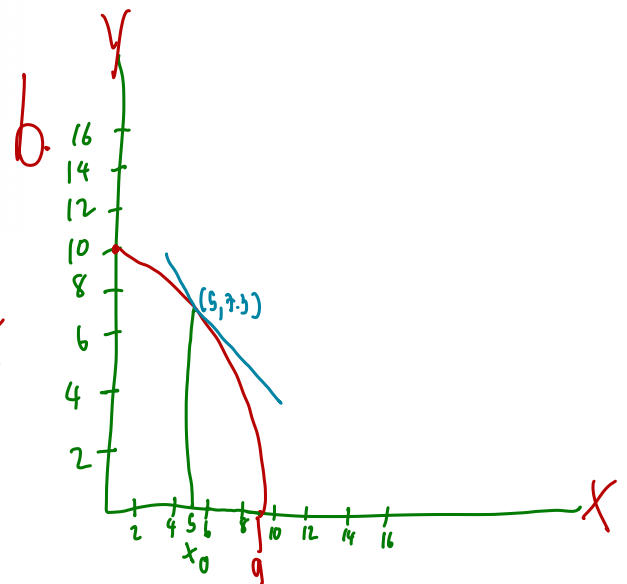


(a)

x	y
4	4
5	3
6	3

opp cost of x

$x_0 \rightarrow 5$



c.

x	y
4	8.4
5	7.5
6	6.4

opp cost of x

0.8

0.9