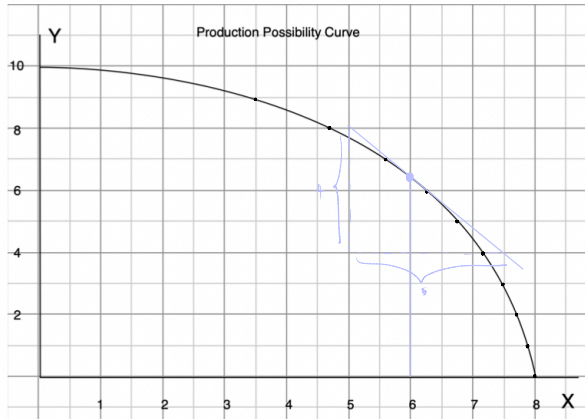


HW#4 Due Jan 27, 2022

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
2	7.7	0.2
3	7.4	0.3
4	7.1	0.3
5	6.7	0.4
6	6.2	0.5
7	5.6	0.6
8	4.7	0.9
9	3.5	1.2
10	0	3.5

- b) Is the opportunity cost of y increasing? *yes!*
 c) Compute the opportunity cost per unit of y when $x = 6$.
 d) At $x = 6$, approximate how much more x can be produced if we have y less by 0.2 units.

→ at point E slope = $-\frac{x}{y}$
 opp cost of x in terms of y
 opp cost of y in terms of x is $\frac{1}{\text{slope}} = \frac{y}{x}$

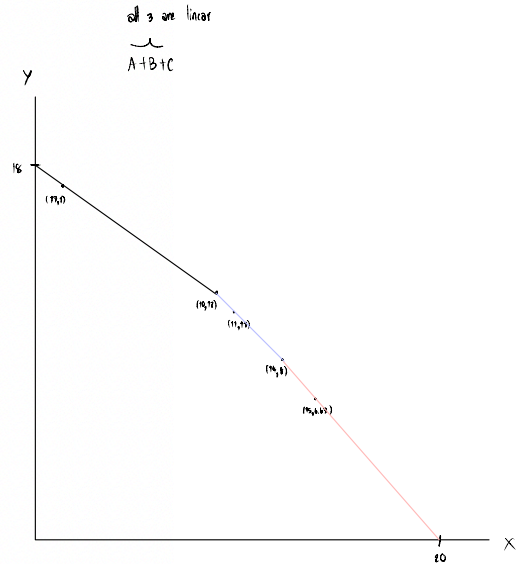
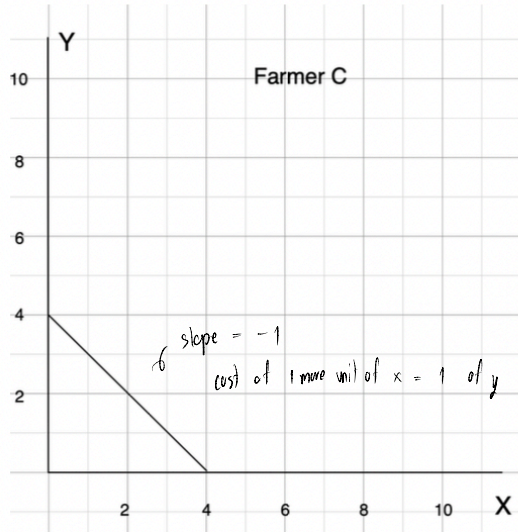
$$(\text{opp. cost of } y) (\Delta y)$$

$$\left(-\frac{5}{4}\right)(-0.2) = \frac{1}{4} = 0.25$$

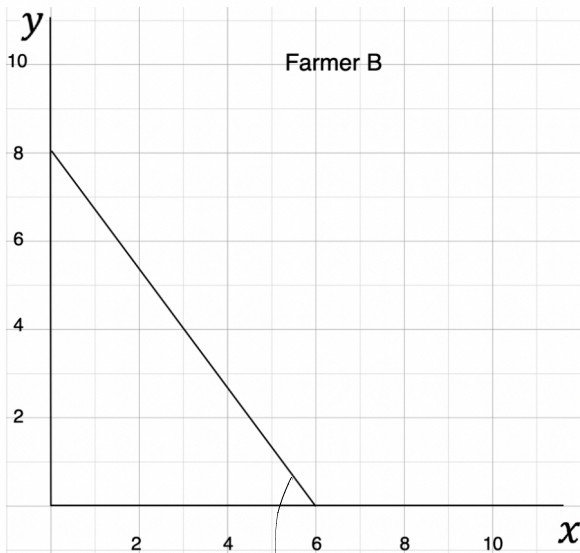
- A slope = -0.6 ① maximum = 10
- B slope = -1.33 3 maximum = 6
- C slope = -1 ② maximum = 4

x	y
0	10
1	9.4
2	8.8
3	8.2
4	7.6
5	7
6	6.4
7	5.8
8	5.2
9	4.6
10	4
11	3.4
12	2.8
13	2.2
14	1.6
15	1
16	0.4
17	-0.2
18	-0.8
19	-1.4
20	-2

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?



old \rightarrow new

$$-\frac{6}{8} \text{ VS } -\frac{3}{8}$$

$$-.75 \text{ VS } -.375$$

double "x" = multiply \leftarrow

$$y = -\frac{6}{8}x + 8 \Rightarrow y = -\left(\frac{6}{8}\right)x + 8$$

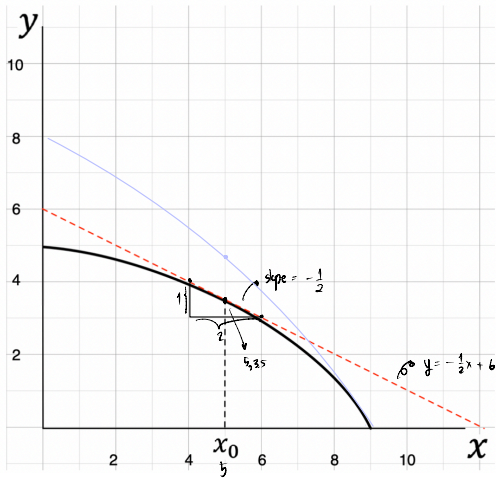
$$y = -\frac{3}{8}x + 8$$

the opportunity cost of x change \Rightarrow decrease

\leftarrow y (slope) = $-\frac{3}{8} \Rightarrow$ increase

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?



$\frac{-1}{2}$

double y = multiply y by 2

slope of y at $x=5$

$2y = -\frac{1}{2}x + 6$

$y = -\frac{1}{4}x + 3$

$-\frac{1}{4}$