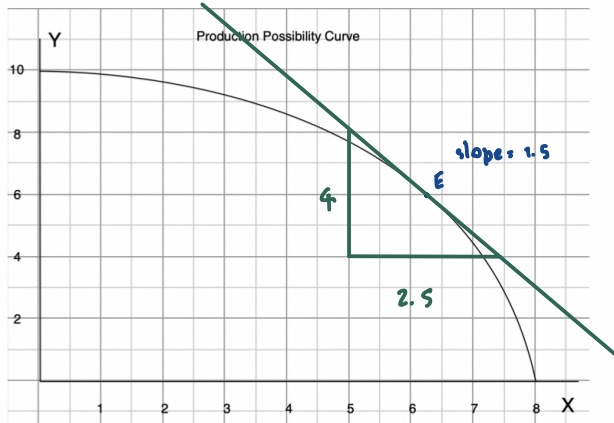


# HW#4 Due Jan 27, 2022

## 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	0.1
1	7.9	0.2
2	7.7	0.3
3	7.4	0.3
4	7.1	0.4
5	6.7	0.3
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  $x = 6$ .  
 d) At  $x = 6$ , approximate how much more  $x$  can be produced if we have  $y$  less by 0.2 units.

c) At point E slope = -1.5

$$\Delta y = \text{slope} \cdot \Delta x$$

$$1 = -1.5 \cdot \Delta x$$

$$0.6 = \Delta x$$

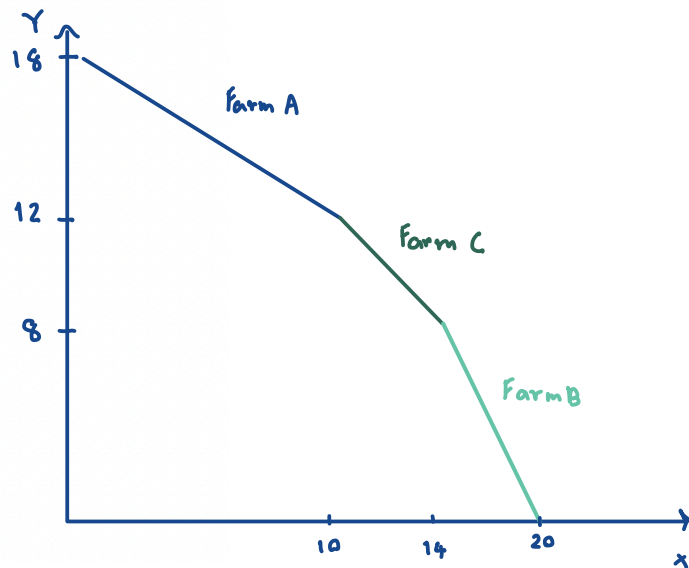
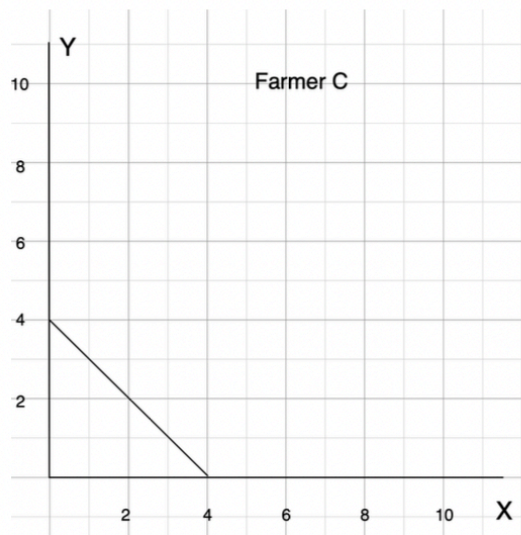
$\therefore$  The opportunity cost per unit of  $y$  at  $x=6$  is 0.6

d)  $\Delta y = \text{slope} \cdot \Delta x$

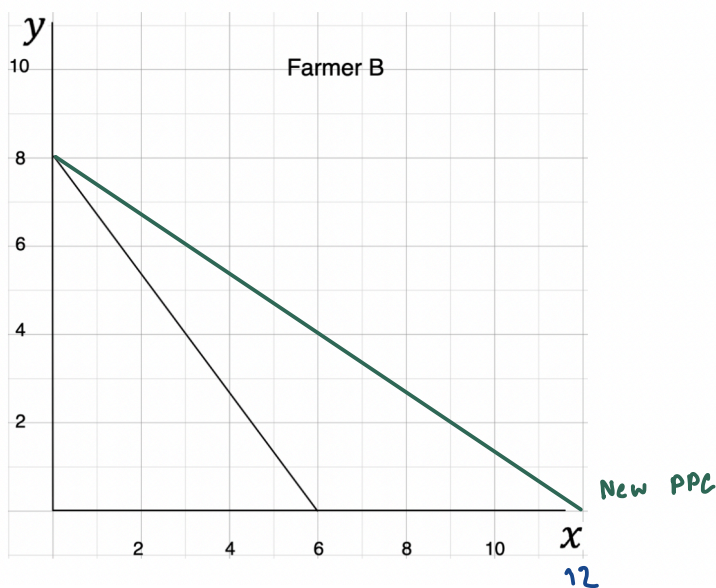
$$0.2 = -1.5 \cdot \Delta x$$

$$0.13 = \Delta x$$

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?



$\therefore$  The opportunity cost of  $x$  decreases.

$\therefore$  The opportunity cost of  $y$  increases

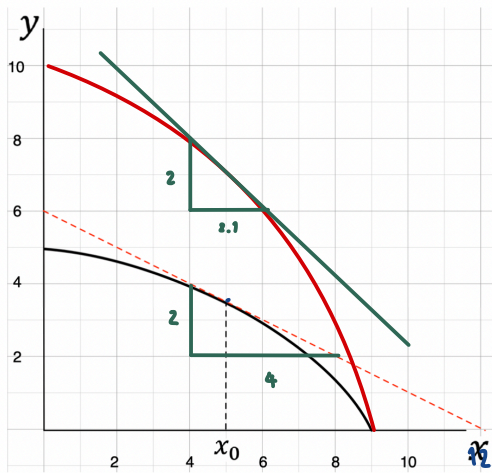
$x$	$y$	opp. cost	$x$	$y$	opp. cost
0	8	} 1.33	0	8	} 0.67
1	6.67		1	7.33	
2	5.34		2	6.66	
3	4.01	} 1.53	3	5.99	} 0.67
$\vdots$	$\vdots$		$\vdots$	$\vdots$	

$y$	$x$
0	6
1	5.25
2	4.5
3	3.75
$\vdots$	$\vdots$

$y$	$x$
0	12
1	10.5
2	9
3	7.5
$\vdots$	$\vdots$

HW. Given the PPC below,

- What is the opportunity cost of  $x$  at  $x_0 = 5$ ?  $\rightarrow 0.5$
- 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?



New PPC

At  $x_0$  for new PPC, the opportunity cost  
is  $\frac{2}{2.1} = 0.95$