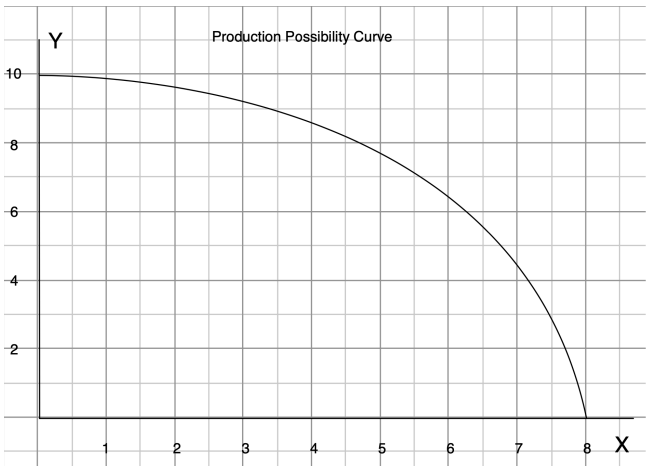
HW Nonlinear PPC



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	7.77	0.13
3	7.5	0.27
4	7.2	0.3
5	6.75	0.45
6	6.25	0.5
7	5.5	0.75
8	4.7	0.8
9	3.3	1.1
10	0	3.3

less of x when y increases

b) Is the opportunity cost of y increasing?
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.

Answer

(b) Yes, exponentially

(c) Use tangent line at $x = 6$ to determine the slope at p intercept c

$\frac{\Delta y}{\Delta x} = \frac{-3}{2} = -1.5$

When we ar computing opportunity cost per u + of y the slope have to be $\frac{1}{\text{slope}}$

so, bp $\frac{1}{1.5} = 0.67$

(d) at $x = 6$, slope $= -0.67$

we can estimate Δx knowing that $\Delta y = -0.2$

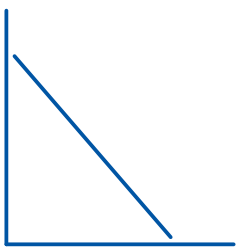
$\Delta x = \frac{1}{\text{slope}} \cdot \Delta y$

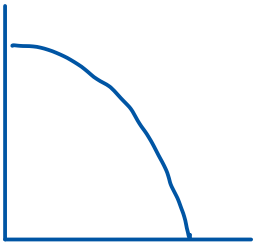
$\approx \frac{1}{(-1.5)} \cdot (-0.2)$

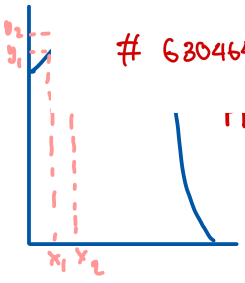
≈ 0.1333 #

Can a PPC have positive slope?

slope > 0







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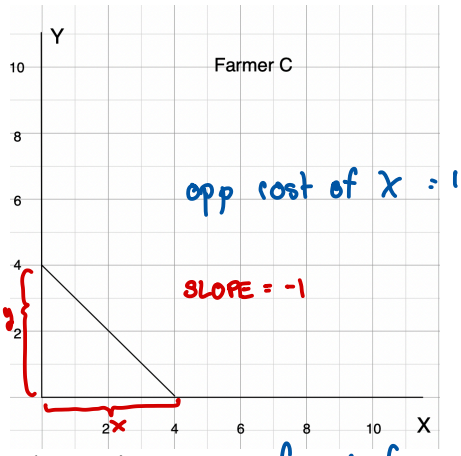
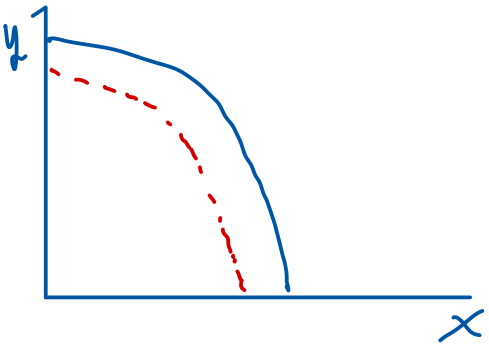
HW Farmer C has the PPC given below. Find the PPC of all three farmers A, B and C combined.



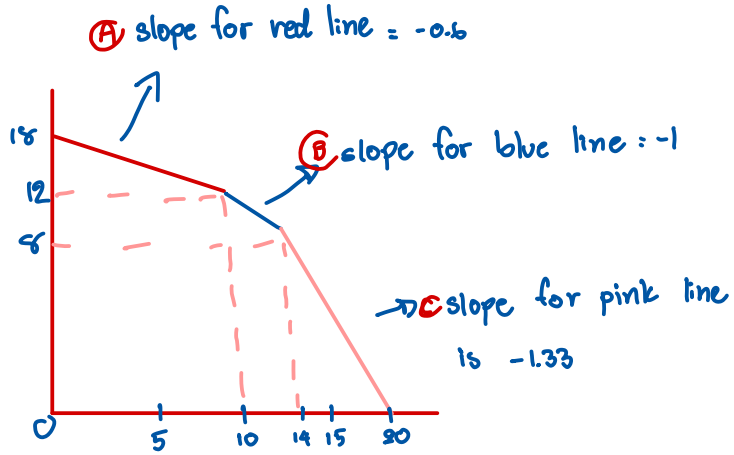
Change in PPC - fixed frequence, most efficient

1. COVID-19



x	y	
0 1 2 3 ⋮ 10	18 17.4 16.8 16.2 ⋮ 12	SLOPE A
11 12 13 14	11 10 9 8	SLOPE C
15 16 17 ⋮ 20	6.67 5.34 4.01 ⋮ 0	SLOPE B

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



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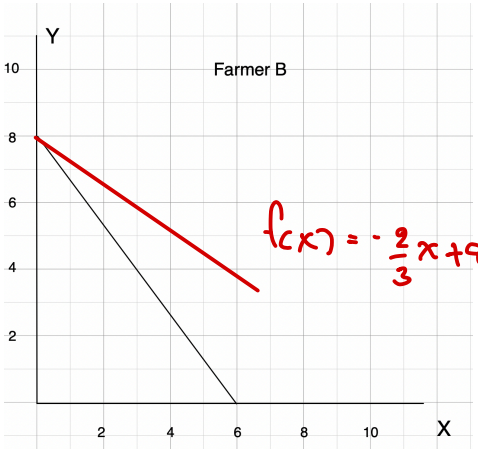
HW. If a new fertilizer is found to double the output of rice (x) for any level of production of fish (y), how will PPC of farmer B change? Does the opportunity cost of x increase? Does the opportunity cost of y increase?



linear line $y = mx+c$, m = slope

At point A $(0,8)$ and $B(6,0)$

SLOPE for M

$$m = \frac{\Delta y}{\Delta x}$$
$$= -\frac{8}{6}$$
$$= \frac{4}{3}$$

FIND C

replace x with 0 as input

$$y = -\frac{4}{3}(0) + c$$
$$8 = c$$
$$\therefore y = -\frac{4}{3}x + 8$$

We still need x in term of y for equation, to multiply 2 for x

$$y = -\frac{4}{3}x + 8$$
$$y - 8 = -\frac{4}{3}x$$
$$-\frac{3}{4}(y-8) = x$$
$$f(y)\sim x = -\frac{3}{4}y + 6 \#$$

$$f(y)_n = 2f(y) = 2\left(\frac{3}{4}y + 6\right)$$
$$f(y)_{new} = -\frac{6}{4}y + 12$$
$$f(y)_n = -\frac{3}{2}y + 12 \#$$
$$x_n = -\frac{3}{2}y + 12$$
$$\frac{2}{3}(x-12) = y$$
$$y = -\frac{2}{3}x + 8 \#$$

Q1: Does the opp cost of x increases?

∴ No, the opp cost of x decreasing from $\frac{4}{3}$ to $\frac{2}{3}$ of y per unit of X

Q2: Does the opp cost of y increases

∴ Yes, from $\frac{3}{4}$ to $\frac{3}{2}$ of x per unit of y

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