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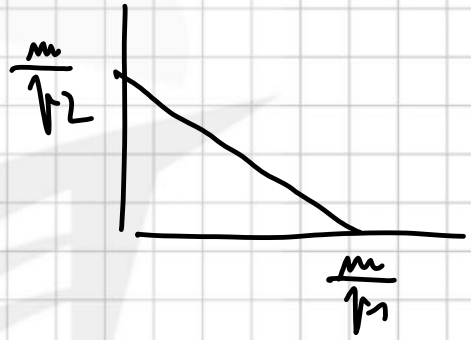
1) $u = x_1^{0,5} \cdot x_2^{0,5} = \sqrt{x_1} \cdot \sqrt{x_2}$

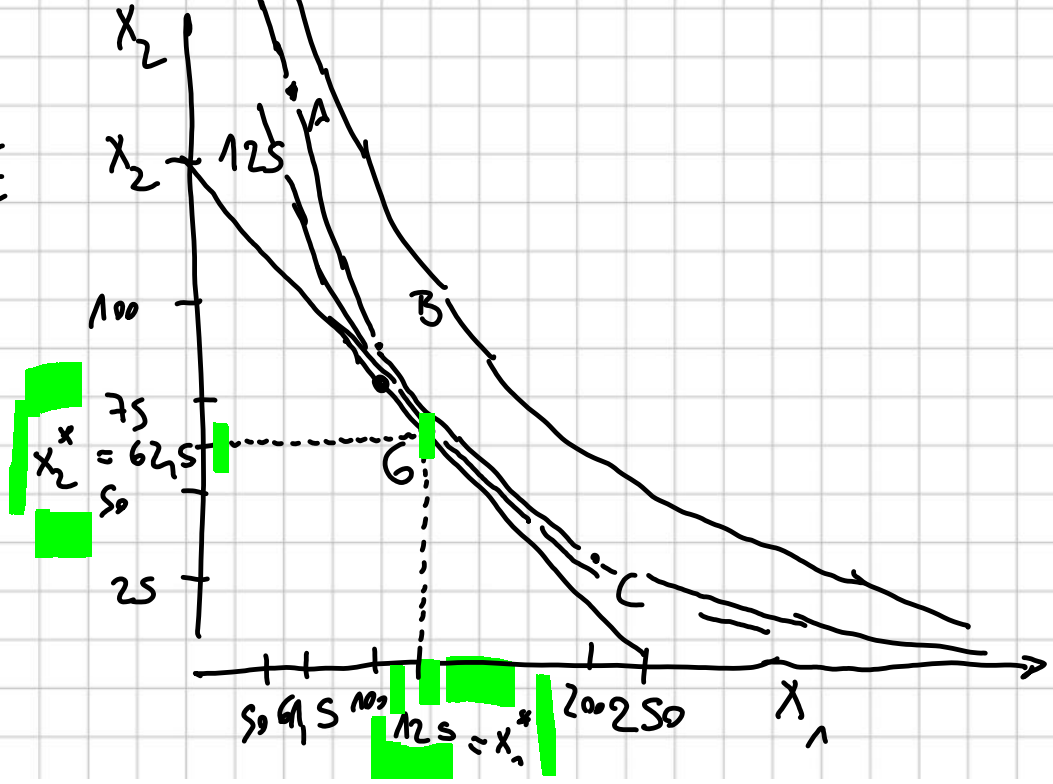
$p_1 = 4$ $\quad B = m = 1.000\ €$

$p_2 = 8$



$B = p_1 x_1 + p_2 x_2$

$1000 = 4x_1 + 8x_2$



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$$\bar{u} = \sqrt{x_1} \cdot \sqrt{x_2} \Rightarrow \sqrt{x_2} = \frac{\bar{u}}{\sqrt{x_1}} \Rightarrow \boxed{x_2 = \frac{\bar{u}^2}{x_1}} \leftarrow \text{ALLG.}$$

z.B. $\bar{u} = 90 \Rightarrow x_2 = \frac{90^2}{x_1} = \boxed{\frac{8100}{x_1} = x_2} \leftarrow$ SPEZIELL FÜR $\bar{u} = 90$

$\boxed{\bar{u} = 90}$

x_1	50	100	200
x_2	162	81	40,5
	A	B	C

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$$u = x_1^{0{,}5} \cdot x_2^{0{,}5}$$

$$(a x^n)' = a \cdot n \cdot x^{n-1}$$

$$\frac{\frac{\partial u}{\partial x_1}}{\frac{\partial u}{\partial x_2}} = \frac{p_1}{p_2} = -\frac{dx_2}{dx_1}$$

$$\frac{\frac{1}{2} \cdot x_1^{0{,}5-1} \cdot x_2^{0{,}5}}{\frac{1}{2} \cdot x_1^{0{,}5} \cdot x_2^{0{,}5-1}} = \frac{4}{8}$$

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$$-0{,}5 - 0{,}5 \qquad 0{,}5 - (-0{,}5)$$

$$\Leftrightarrow \quad x_1 \cdot x_2 = \frac{1}{2}$$

$$\Leftrightarrow \quad x_1^{-1} \cdot x_2^{1} = \frac{1}{2} \quad \Leftrightarrow \quad \frac{x_2}{x_1} = \frac{1}{2}$$

$$\Leftrightarrow \quad \boxed{x_2 = \frac{1}{2} \cdot x_1}$$

$$\frac{x^n}{x^m} = x^{n-m}$$

$$x^{-m} = \frac{1}{x^m}$$

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$$1000 = 4 \cdot x_1 + 8 x_2 = 4 \cdot x_1 + 8 \cdot \left(\frac{1}{2} \cdot x_1 \right) = 4 x_1 + 4 x_1 = 8 x_1$$

$$\Leftrightarrow \boxed{x_1^* = 125}$$

$$x_2 = \frac{1}{2} \cdot x_1 = \frac{1}{2} \cdot 125 = \boxed{62{,}5 = x_2^*}$$

$$\mu = \sqrt{x_1} \sqrt{x_2} = \sqrt{125} \cdot \sqrt{62{,}5} = 88{,}388$$

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2)

$$\eta = \frac{dx}{dp} \cdot \frac{p}{x}$$

$p \uparrow\downarrow$ um $a\,\%$ $\rightarrow$ $x \downarrow\uparrow$ um $a \cdot \eta\,\%$

$$p = 12 - 6x \quad \Leftrightarrow \quad p - 12 = -6x \quad \Leftrightarrow \quad \frac{p-12}{-6} = x \quad \Leftrightarrow \quad x = \frac{p}{-6} + \frac{(-12)}{(-6)}$$

INVERSE NACHFRAGE

$$\Leftrightarrow \quad x = 2 - \frac{1}{6} \cdot p$$

... NACHFRAGEFKT.

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c) $\eta = \frac{\Delta x}{\Delta p} \cdot \frac{p}{x} = -\frac{1}{6} \cdot \frac{p}{2 - \frac{1}{6} \cdot p} = -\frac{1}{6} \cdot \frac{p}{\frac{12}{6} - \frac{p}{6}}$

$= -\frac{1}{6} \cdot \frac{p}{\frac{12-p}{6}} = -\frac{1}{\cancel{6}} \cdot p \cdot \frac{\cancel{6}}{12-p} = -\frac{p}{12-p}$

$= \frac{p}{-(12-p)} = \frac{p}{-12+p} = \boxed{\frac{p}{p-12} = \eta}$

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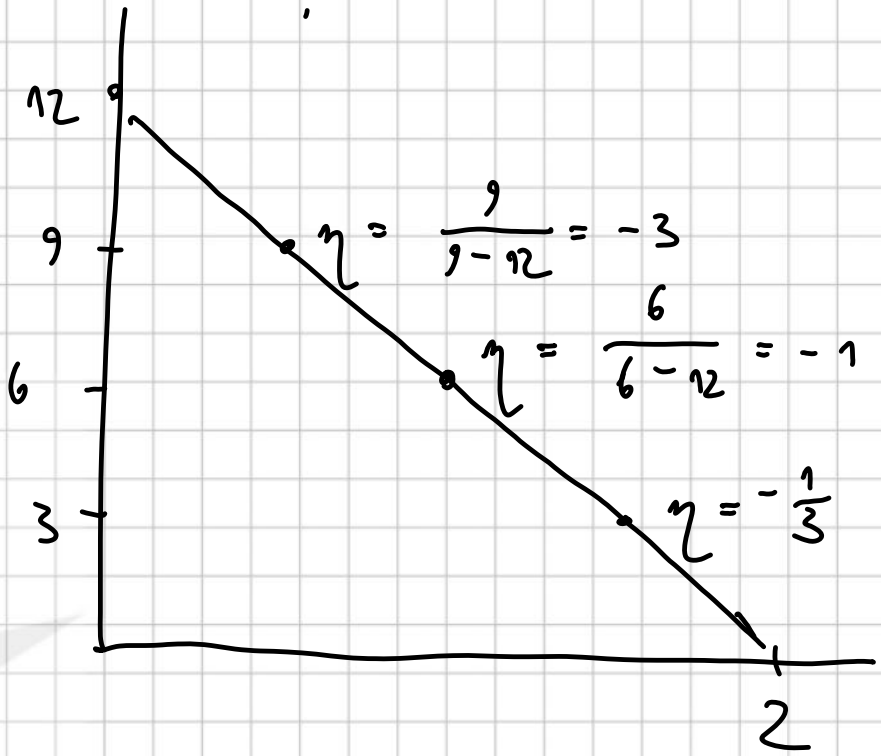
2 | c)



$r = 12 - 6x$

$$\eta = \frac{r}{r - 12}$$

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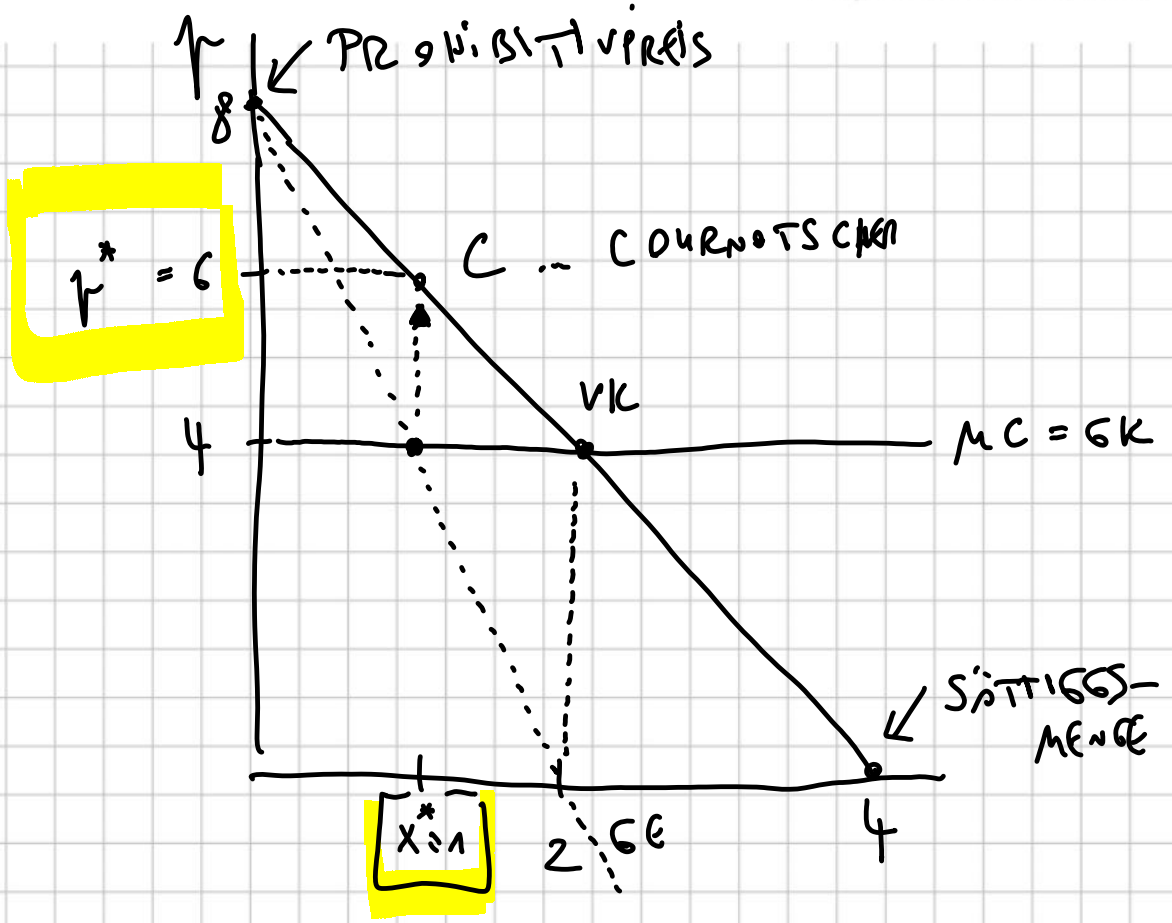
4)

$$p = 8 - 2x$$

$$k = 4x + 1$$

$GE = GK \Leftrightarrow MR = MC$

$$\left(\underbrace{(8-2x)}_{p(x)} \cdot x \right)' = \underbrace{(4x+1)}_{C(x)}'$$



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$$\Leftrightarrow \left(8x - 2x^2\right)' = \left(4x + 1\right)'$$

$$\Leftrightarrow 8 - 4x = 4$$

$$\Leftrightarrow -4x = -4 \Leftrightarrow \boxed{x = 1} \Rightarrow p = 8 - 2 \cdot x = 8 - 2 \cdot 1 = 6$$

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3

$p_1 \downarrow$

$GE = SE + \dot{E}E$