MAT 1700

LØSNINGSFORSLAG

SEMINAR # 3

Oppgave 1

Seminar # 3

$$U(x,y) = x \cdot y$$

(a) Interior optimum (indre lokevekt) må tilfredsstille:

$$P_x \cdot x + P_y \cdot y = I$$

i) optimal kons. komb. ligge på budsjettlinjen

ii) 'tangeringsbetingelsen' må holde; dvs.

$MU_x / MU_y = \frac{p_x}{p_y}$ hvor marg. 'nytte' er

$$\frac{\partial U}{\partial x} = y \; ; \quad \frac{\partial U}{\partial y} = x \quad \ldots \text{ derfor}$$

$$\frac{y}{x} = \frac{p_x}{p_y} \Rightarrow y = \left(\frac{p_x}{p_y}\right) x$$

Innsatt i budsj. betingelsen:

$$p_x \cdot x + \left[\left(\frac{p_x}{\cancel{p_y}}\right) x\right] \cancel{p_y} = I$$

$$p_x \cdot x + p_x \cdot x = I$$

$$\underline{\underline{x = I / 2p_x}}$$

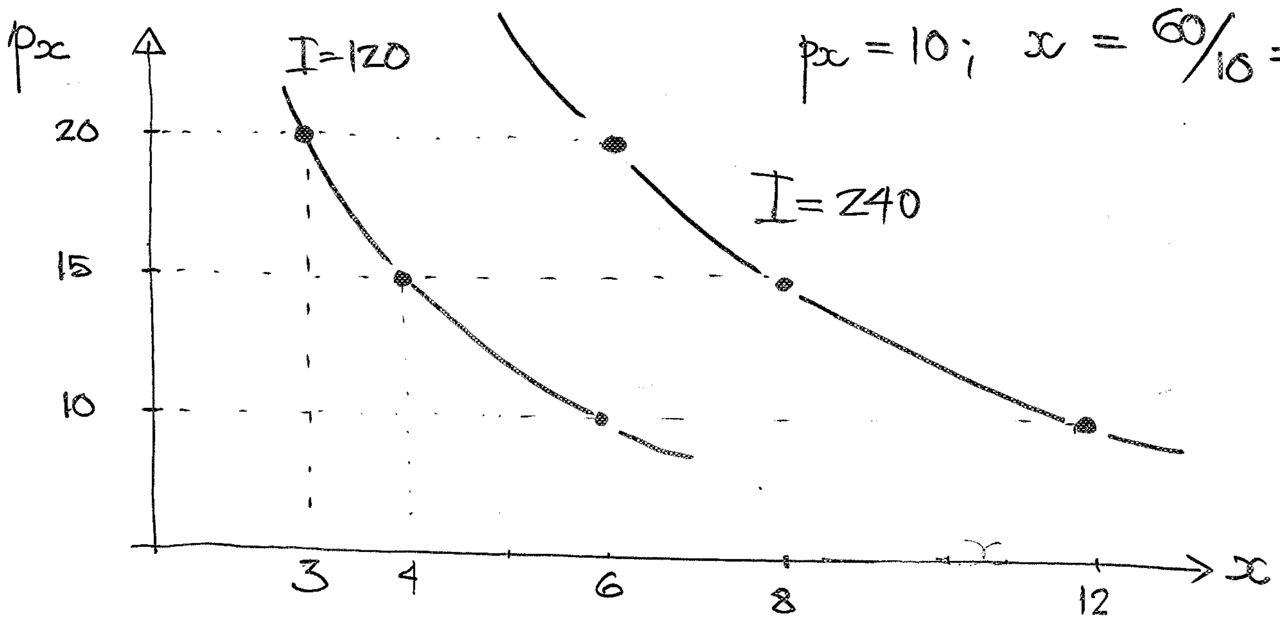
(b) 'Mat' normalt gode? JA!!

$I = 120; \quad x = 120/2p_x = 60/p_x$

i) $p_x = 15; \quad x = 60/15 = 4$

$p_x = 20; \quad x = 60/20 = 3$

$p_x = 10; \quad x = 60/10 = 6$



La $I_1 = 240$

$p_x = 20; \quad x = 240/2 \cdot 20 = \frac{240}{40} = \underline{6}$

$p_x = 15; \quad x = \frac{240}{2 \cdot 15} = \frac{240}{30} = \underline{8}$

$p_x = 10; \quad x = \frac{240}{2 \cdot 10} = \frac{240}{20} = 12$

Seminar # 3

Oppgave 2

$m/p_2 = \frac{72}{1} = 72$

$m/p_1 = \frac{72}{9} = 8$

$U(x,y) = x \cdot y$

$MU_x = y$; $MU_y = x$

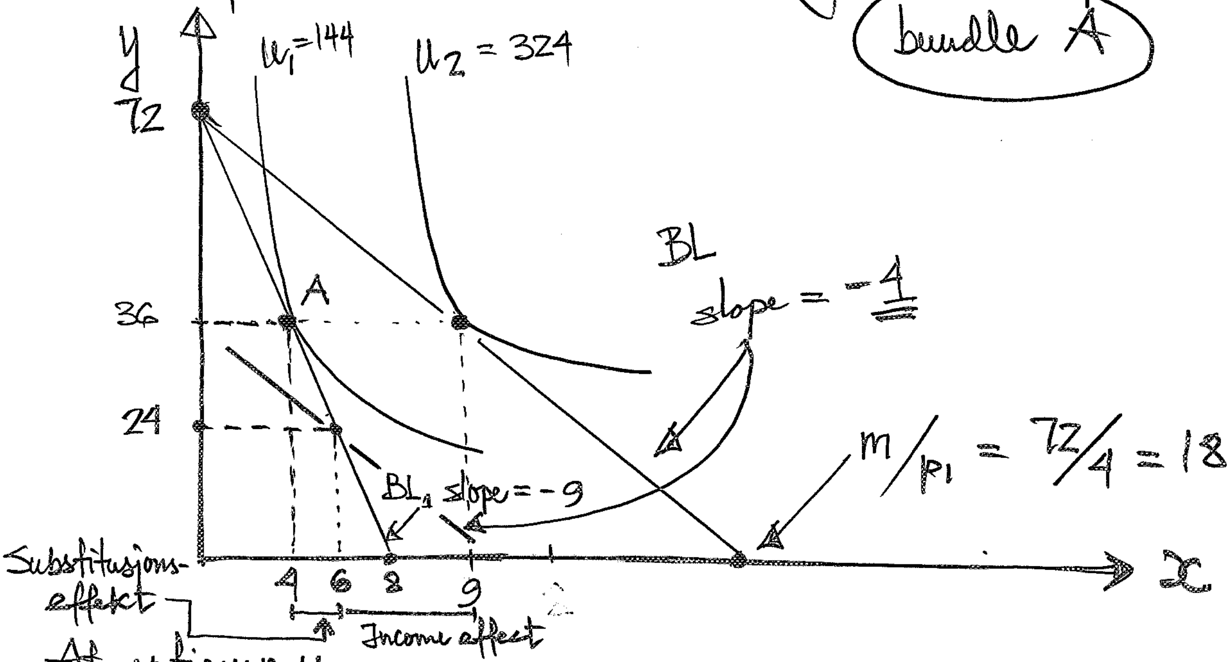
$p_y = 1$

$m = 72$

$p_x = 9$

$$\boxed{\begin{aligned} &p_x \cdot x + p_y \cdot y = m \\ &9x + y = 72 \\ &y = -\frac{9}{1}x + \frac{72}{9} = -9x + 8 \end{aligned}}$$

① Optimale kons. kombinasjon gitt $p_x = 9$ — bundle A



At optimum;

① på budsj. linjen: $9x + y = 72$

② $\frac{MU_x}{MU_y} = \frac{y}{x} = \frac{p_x}{p_y} = \frac{9}{1} \Rightarrow y = 9x$

To ligninger og to ukjente

$$\begin{aligned} 9x + y &= 72 \\ y &= 9x \end{aligned} \Rightarrow 9x + 9x = 72$$

$18x = 72 \Rightarrow \underline{x = 4}; \ \underline{y = 36}$

$U(x,y) = x \cdot y = 4 \cdot 36 = \underline{\underline{144}}$

Demand for x

$$x = M/2p_x = 72/2p_x = \frac{36}{p_x}$$

$$\downarrow$$

$$4 = \frac{36}{9}$$

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(2) Final cons. basket when $p_x = 4$ Bundle C

$$\left.\begin{aligned} 4x + y &= 72 \\ y &= 4x \end{aligned}\right\} \quad y = -\frac{p_x}{p_y}x + \frac{M}{p_y} = -\frac{4}{1}x + \frac{72}{1}$$

$$= -4x + 72$$

$$\Rightarrow 4x + 4x = 72 \Rightarrow \underline{\underline{x = 9}}$$

$$y = 4x = 4 \cdot 9 = \underline{\underline{36}}$$

$$U_2 = U(x, y) = x \cdot y = 9 \cdot 36 = \underline{\underline{324}}$$

(3) Dekomponering- basket

Tilfredsstille (1) Opprinnelige nyttekurven plassering

$$U_1 = 144 = x \cdot y$$

(2) Nyttekurven og dekomp. linjen tangent til hverandre

$$\Rightarrow \text{tangering } \frac{MU_x}{MU_y} = \frac{y}{x} = \frac{p_x}{p_y} = \frac{y}{x} = \frac{4}{1} = 4$$

$$\Rightarrow y = 4x$$

To betingelser må være oppfylt:

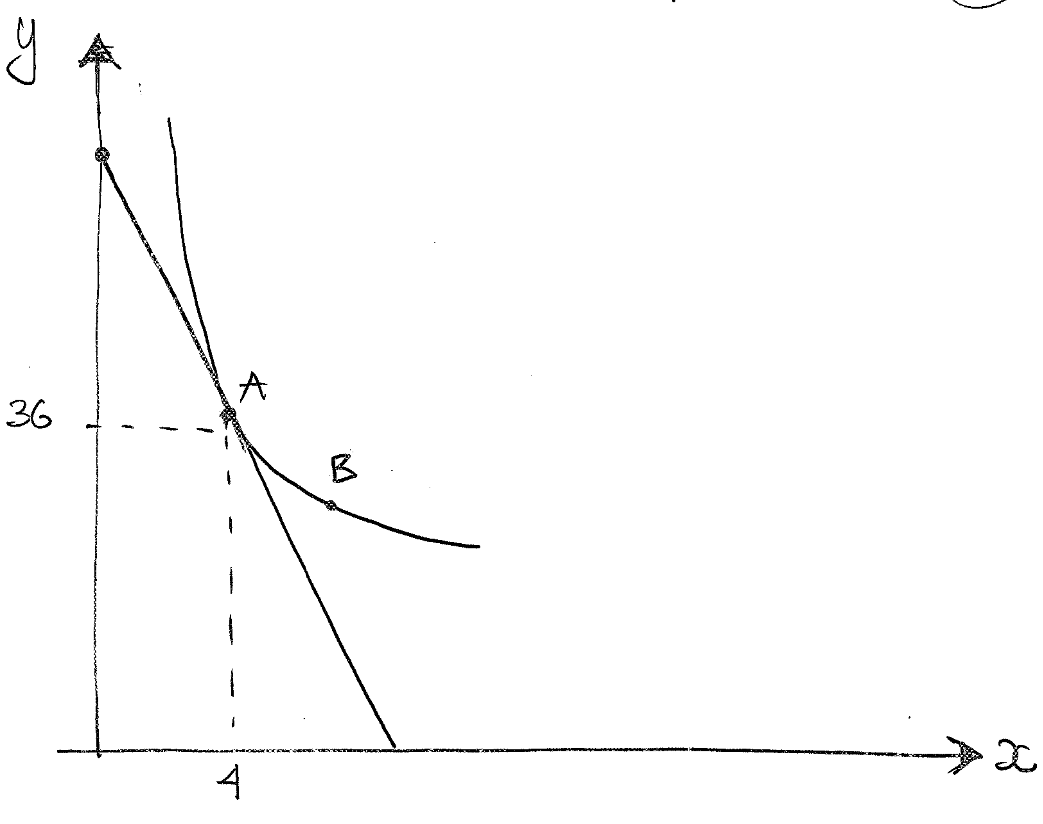
$$U = x \cdot y = 144$$

$$y = 4x$$

$$\Rightarrow U = x \cdot 4x = 144$$

$$4x^2 = 144$$

$$x = \frac{\sqrt{144}}{\sqrt{4}} = \frac{12}{2} = \underline{\underline{6}} \; ; \; y = \underline{\underline{24}}$$



Seminar #3

Oppgave 3

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$U(x,y) = 2\sqrt{x} + y$

$MU_x = \frac{1}{\sqrt{x}}$; $MU_y = 1$

p_x = Freia melkesjokolade = 0,50

(a) $\frac{MU_x}{MU_y} = \frac{\frac{1}{\sqrt{x}}}{1} = \frac{1}{\sqrt{x}} = \frac{p_x}{p_y} = \frac{1}{\sqrt{x}} = \frac{0{,}50}{1} = p_x$

$\Rightarrow \boxed{\frac{1}{\sqrt{x}} = 0{,}50} \Rightarrow \frac{1}{x} = (0{,}50)^2 = 0{,}25$

$\frac{1}{\sqrt{x}} = p_x \Rightarrow x = \frac{1}{(p_x)^2}$

$p_x = 0{,}50 \Rightarrow x = \frac{1}{(0{,}50)^2} = 4$

(1) $p_x x + p_y \cdot y = M$

$0{,}50(4) + 1y = 10 \Rightarrow y = 8$ composite good.

(b) $p_x = 0{,}20$ fra opprinnelig 0,50

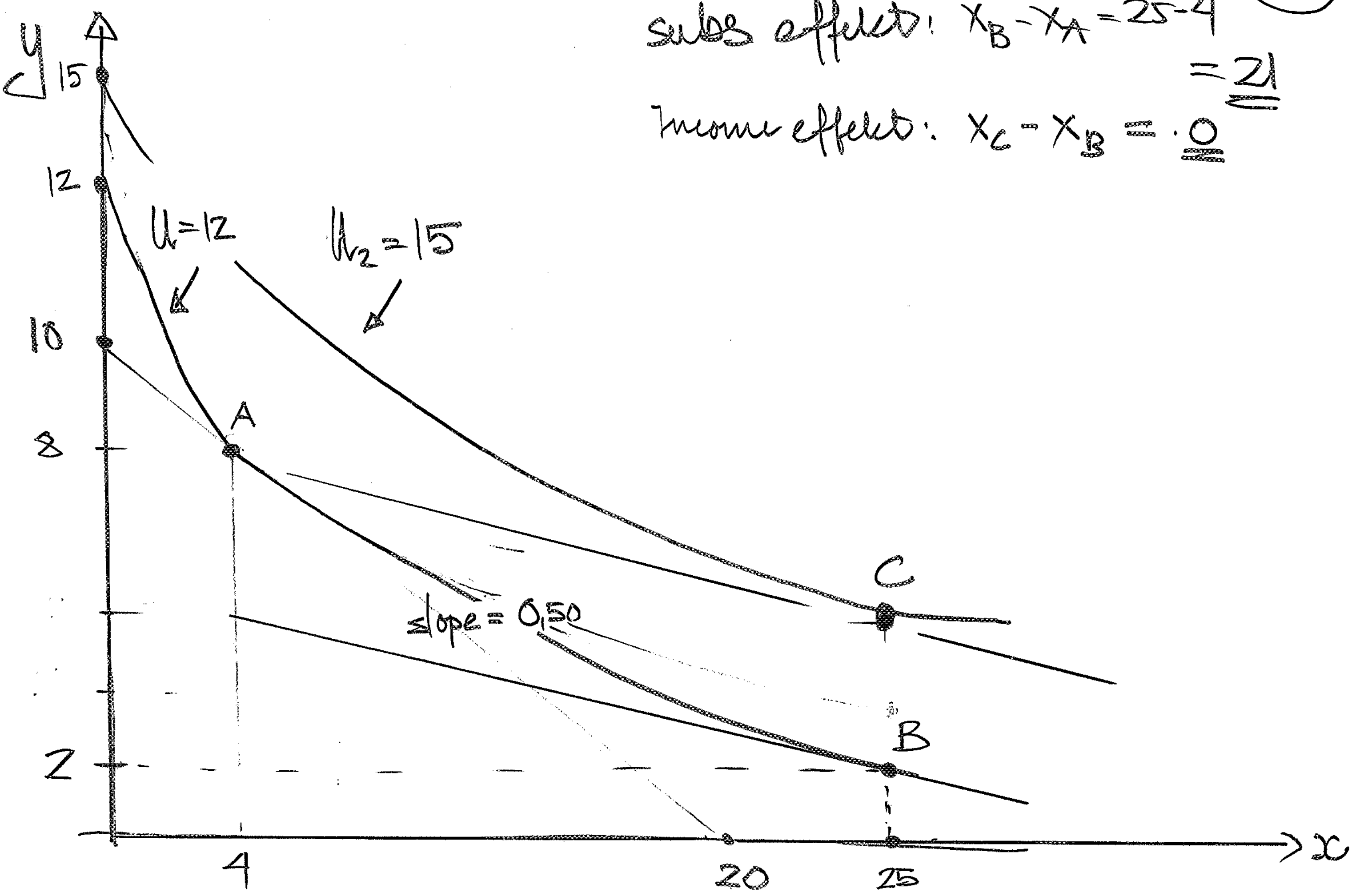
$x = \frac{1}{(p_x)^2} = \frac{1}{(0{,}20)^2} = \frac{1}{0{,}04} = 25$

innsatt i (1): $0{,}20(25) + 1 \cdot y = 10 \Rightarrow y = 5$

6/6

subs effekt: $X_B - X_A = 25-4 = \underline{\underline{21}}$

Income effekt: $X_C - X_B = \underline{\underline{0}}$



Dekomponering: $U_1 = 2\sqrt{x}+y = 2\sqrt{4}+8 = 12$

$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y} = \frac{0{,}50}{1} = 0{,}50$$

Dekomponering

$$\frac{\frac{1}{\sqrt{x}}}{1} = \frac{0{,}20}{1} = \frac{1}{\sqrt{x}} = 0{,}20 \Rightarrow x = \underline{25}$$

$$0{,}20(25) + 1\cdot y = 10$$

$$5 + y = 10 \Rightarrow y = \underline{\underline{5}}$$

Oppgave 4 Varian p. 135 #2

$(p_1\ p_2) = (2,1) \Rightarrow (x_1, x_2) = (1,2)$

$(q_1\ q_2) = (1,2) \Rightarrow (y_1, y_2) = (2,1)$

konsistent med økonomisk maksimerende adferd?

1) $x = 1\cdot2 + 2\cdot1 = \underline{\underline{4}} < y = 1\cdot1 + 2\cdot2 = \underline{5}$

2) $y = 2\cdot1 + 1\cdot2 = \underline{\underline{4}} < x = 1\cdot1 + 2\cdot2 = \underline{5}$

Svar: Ja! Overensstemmelse med WARP (weak axiom of Revealed Preference)

Oppgave 5 Varian p. 135 # 3

Vi – som observatører – vet ikke, fordi konsumkombinasjonen Y dyrere enn konsumkomb. X da X ble kjøpt,

og

kons.komb X dyrere enn kons.komb. Y da Y ble kjøpt