MAT 1700 - Løsningsforslag

Oppgaveseminar 2

Konsumenttilpasning

Oppgave 1

$$U(x,y) = x \cdot y \qquad x = \text{mat};\ y = \text{klær}$$

Langs nyttekurven: $p_x \cdot \Delta x + p_y \Delta y = 0$

$$\Rightarrow \frac{\Delta x}{\Delta y} = -\frac{p_x}{p_y}$$

$$MU_x = \frac{\Delta U}{\Delta x} = \frac{\partial u(x\cdot y)}{\partial x} = y$$

$$MU_y = \frac{\Delta U}{\Delta y} = \frac{\partial u(xy)}{\partial y} = x$$

$$MRS = -\frac{\partial u(x\cdot y)/\partial x}{\partial u(x\cdot y)/\partial y} = \frac{y}{x}$$

At optimum: $MRS = -\frac{p_x}{p_y} \Leftrightarrow \frac{y}{x} = \frac{p_x}{p_y}$

$$\boxed{y \cdot p_y = p_x \cdot x} \qquad \Rightarrow x = y \cdot \frac{p_y}{p_x}$$

$$\frac{y}{p_x} = \frac{x}{p_y}$$

innsatt i budsjettbetingelsen $\Longrightarrow$

$$\boxed{\frac{x}{p_y} = \frac{y}{p_x} \Rightarrow \frac{y}{p_x} \cdot p_y \Rightarrow x = y \cdot \frac{p_y}{p_x}}$$

%

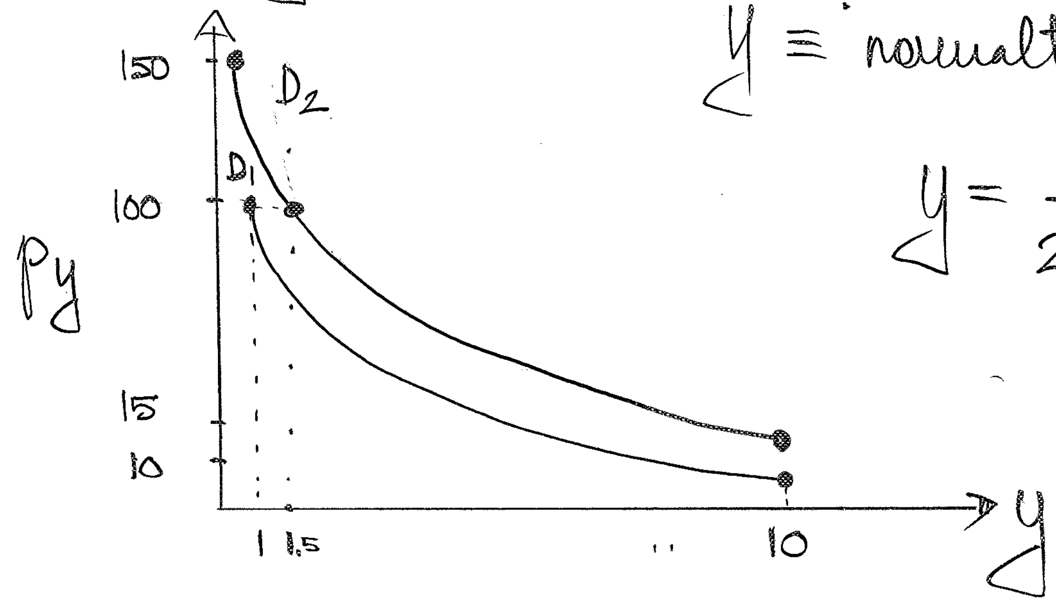
Oppgave 1, forts

$$p_x \cdot x + p_y \cdot y = m$$

$$\cancel{p_x}\left[y \cdot \frac{p_y}{\cancel{p_x}}\right] + p_y \cdot y = m$$

$$2 p_y \cdot y = m \quad \Rightarrow \quad y = m/2p_y$$

(b) Ja... fordi når $P_x = \overline{P}_x$; når m øker så øker også y



y ≡ 'normalt' gode

$$y = \frac{m}{2P_y}$$

$$D_1: \; y = 200/2p_y$$

$$D_2: \; y = 300/2p_y$$

(c) Kryss-pris elastisitet

$$\epsilon_{x,p_y} = \frac{\frac{\Delta x}{\Delta p_y}}{\frac{x}{p_y}} = 0$$

$$\Rightarrow \epsilon_{x,p_y} = \frac{\Delta x}{\Delta p_y} \cdot \frac{p_y}{x}$$

./.

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

$D(x)$ upåvirket av p_y.

$D(y)$ —"— av p_x

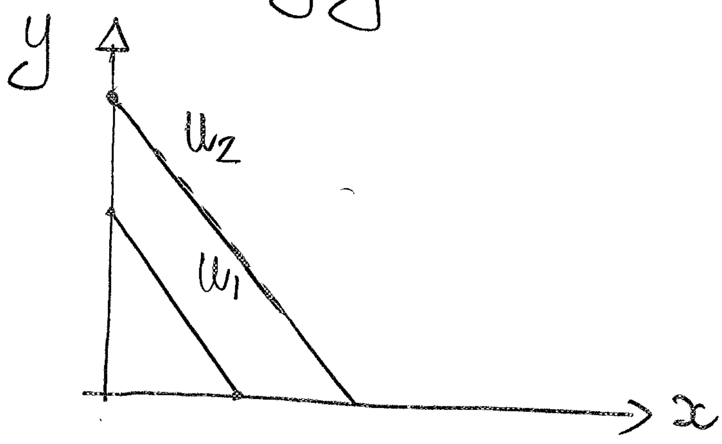
In fact; divides m equally between two goods regardless of the price of either.

Since demand independent of the price of the other good $\Rightarrow$ cross-price elasticity $= 0$

Oppgave 2 $\quad U(x,y) = 3x + y$

(a) Ja; $U(x,y) \uparrow$ når x og y øker

(b) Konstant $= 3$



(c) $MRS_{x,y} = 3$

(d) Konstant

Oppgave 3 $\quad u(x,y) = x^{0,4} y^{0,6}$

(a) Ja... $u(x,y)\uparrow$ når $x\uparrow$ og/eller $y\uparrow$

(b) $mu_x = 0.4 x^{-0,6} y^{0,6}$

$$= \frac{0.4\, y^{0,6}}{x^{0,6}}$$ positiv, men avtakende

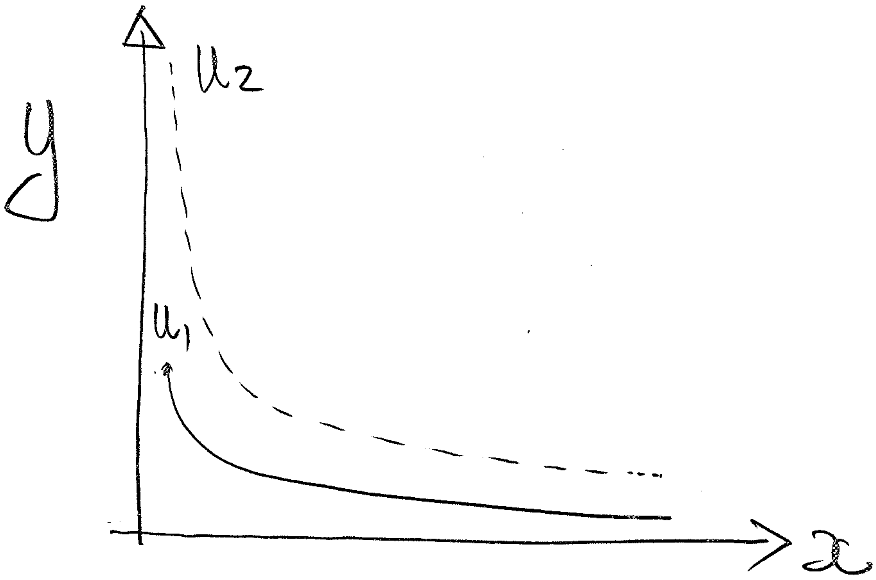
(c) $mu_y = 0.6\, x^{0,4} y^{-0,4} = \frac{0.6\, x^{0,4}}{y^{0,4}}$

$$MRS_{x,y} = \frac{\frac{.4 y^{.6}}{x^{.6}}}{\frac{.6 x^{.4}}{y^{.4}}} = \frac{.4 y^{0,6}}{x^{0,6}} \cdot \frac{y^{0,4}}{.6 x^{0,4}}$$

$$= \frac{0.4 y}{0.6 x}$$

(d) $MRS_{x,y}$ øker når x reduseres til fordel for y

Oppgave 3



Oppgave 4

$$u(x,y) = x^2 + y^2$$

(a) Ja

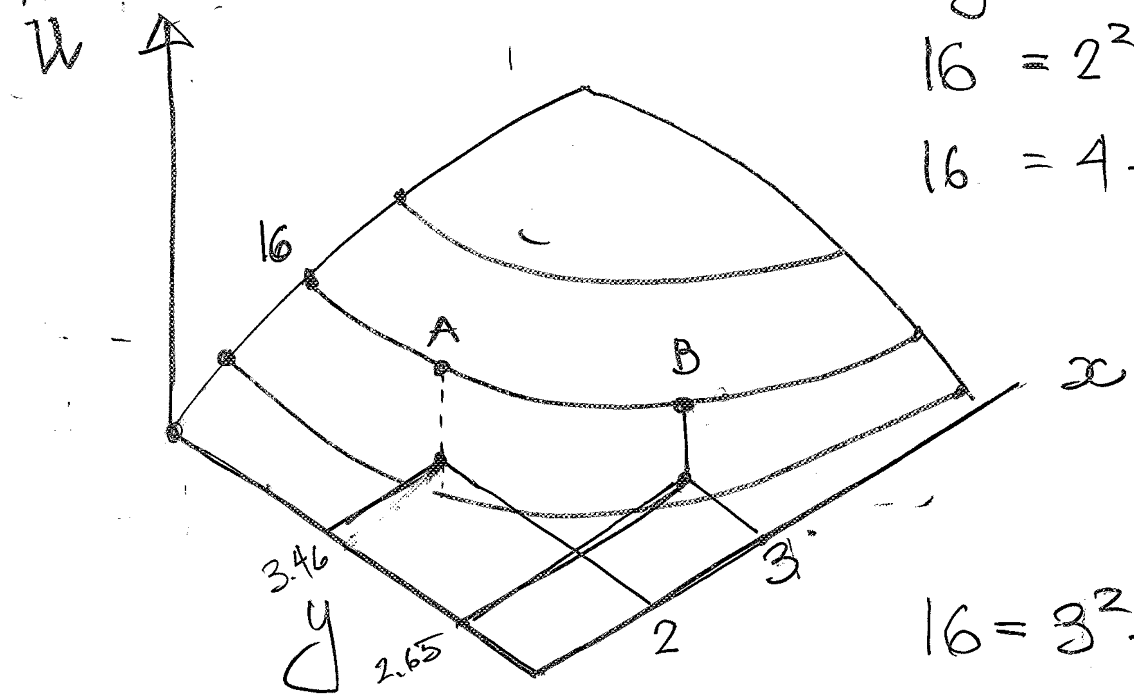
(b) $MU_x = \frac{\partial u}{\partial x} = 2x > 0$

(c) $MRS_{x,y} = \frac{\frac{\partial u}{\partial x}}{\frac{\partial u}{\partial y}} = \frac{2x}{2y} = \frac{x}{y}$

(d) Avtakende når $x \downarrow$ og $y \uparrow$

(e) $MRS_{x,y}$ ~~...~~ avtakende...

Opgave 4. forts



$U(x,y) = x^2 + y^2$

$16 = 2^2 + y^2 \Rightarrow y^2 =$

$16 = 4 + y^2 \Rightarrow y = 3.46$

$16 = 3^2 + y^2$

$16 - 3^2 = y^2$

$7 = y^2$

$\sqrt{7} = y = 2.65$

Oppgave 5

$H \equiv$ hamb ; $p_H = 3$

$M \equiv$ milkshake ; $p_m = 1$

$$MRS_{H,m} = 2 \neq p_H / p_m = 3$$

Nei ... ikke optimum!

$$\frac{MU_H}{p_H} = \frac{MU_m}{p_m} \; ; \quad p_H = 3, \; p_m = 1$$

$$MRS_{H,m} = 2$$

$$= \frac{\frac{\partial u}{\partial H}}{\frac{\partial u}{\partial m}} = 2 = \frac{2}{\frac{\partial u}{\partial m}}$$

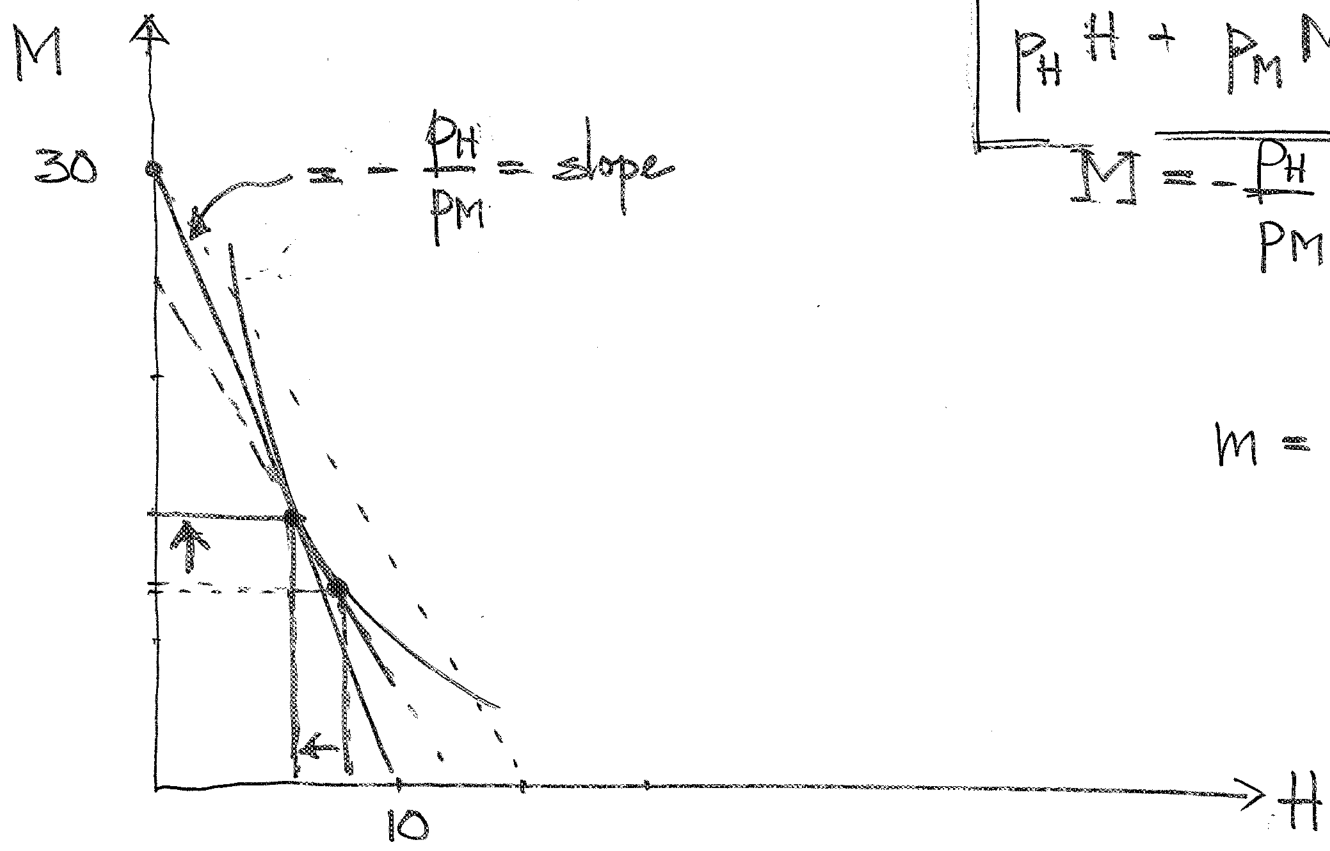
$$\frac{\partial u}{\partial m} = 1 = MU_m$$

$$\frac{2}{3} < \frac{1}{1}$$

$$\underbrace{\text{bang for buck hamburges} < \text{bang for buck milkshakes}}$$

increase tot. utility by reallocating spending by purchasing more milshakes and fewer hamburgers.

Oppgave 5 "Seminaroppgave 2"



$$\boxed{p_H H + p_M M = m}$$

$p_M = 1$

$p_H = 3$

$$M = -\frac{p_H}{p_M} H + \frac{m}{p_M} = -\frac{3}{1} H + \frac{m}{1}$$

$$M = -3H + m$$

$$m = 30 \Rightarrow M = -3H + 30$$

$H = 0;\ M = 30$

$H = 10;\ M = 0$

$$H = -\frac{p_M}{p_H} M + \frac{m}{p_H}$$

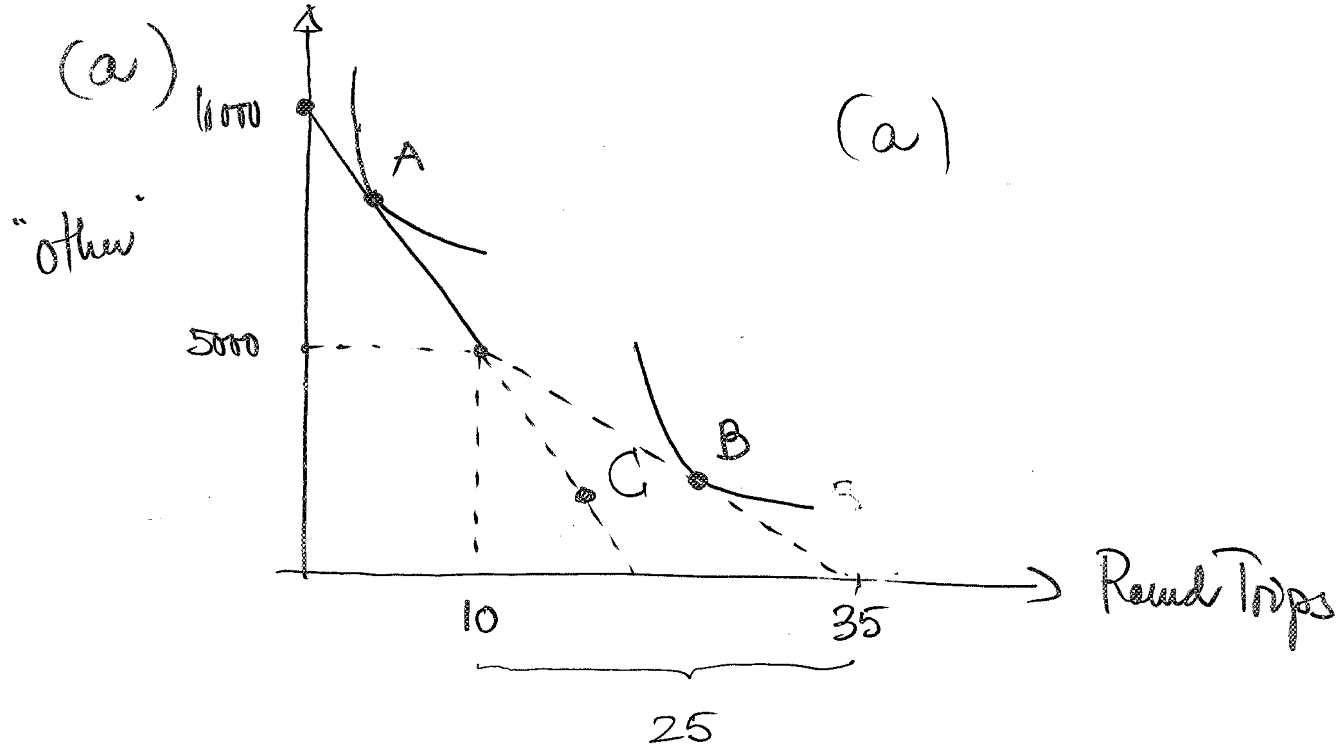
$m = 30;\quad H = -\frac{1}{3} M + 10$

$M = 0;\ H = 10$

$M = 30;\ H = 0$

Oppgave 6

(a)



b) At B ⇒ better-off w/ frequent flyer program than w/o ~~at~~ pt. C

c) At point A.