EX 146 PAG 154

$X = 1200 - 2P1 - P2$

$Y = 1500 - P1 - 3P2$

$C = x^2 + xy + y^2$

VINCOLO TECNICO

$Y = -x + 60$ $\boxed{X \leq 60}$

$Y \geq 0 \Rightarrow$

vincoli di segno

$x \geq 0, y \geq 0$

$0 \leq x \leq 60$

$P_1 \geq 0, P_2 \geq 0$

$$\begin{cases} X = 1200 - 2P1 - P2 \\ Y = 1500 - P1 - 3P2 \end{cases} \Rightarrow \begin{cases} P2 = 1200 - 2P1 - X \\ y = 5P1 - 2100 + 3X \end{cases}$$

$$\begin{cases} \text{IDEM} \\ -5P1 = -2100 + 3X - y \end{cases} \Rightarrow \begin{cases} \text{IDEM} \\ P1 = 420 - \frac{3}{5}x + \frac{1}{5}y \end{cases}$$

$$\begin{cases} P2 = 1200 - 2\left(420 - \frac{3}{5}x + \frac{1}{2}y\right) \\ \text{IDEM} \end{cases} \Rightarrow \begin{cases} P2 = 360 + \frac{1}{5}x - \frac{2}{5}y \\ P1 = 420 - \frac{3}{5}x + \frac{1}{5}y \end{cases}$$

$R(x;y) = P1 \cdot x + P2 \cdot y$

$= 420x - \frac{3}{5}x^2 + \frac{1}{5}xy + 360y + \frac{1}{5}xy - \frac{2}{5}y^2$

$$\boxed{= -\frac{3}{5}x^2 - \frac{2}{5}y^2 + \frac{2}{5}xy + 420x + 360y}$$

$U = R - C$

$= -\frac{3}{5}x^2 - \frac{2}{5}y^2 + \frac{2}{5}xy + 420x + 360y - x^2 - xy - y^2$

$$\boxed{= -\frac{8}{5}x^2 - \frac{7}{5}y^2 - \frac{3}{5}xy + 420x + 360y}$$

SOSTITUIRE IL VINCOLO ALL'UTILE

$y = 60 - x$

$y \geq 0 \Rightarrow 60 - x \geq 0$

$x \leq 60$

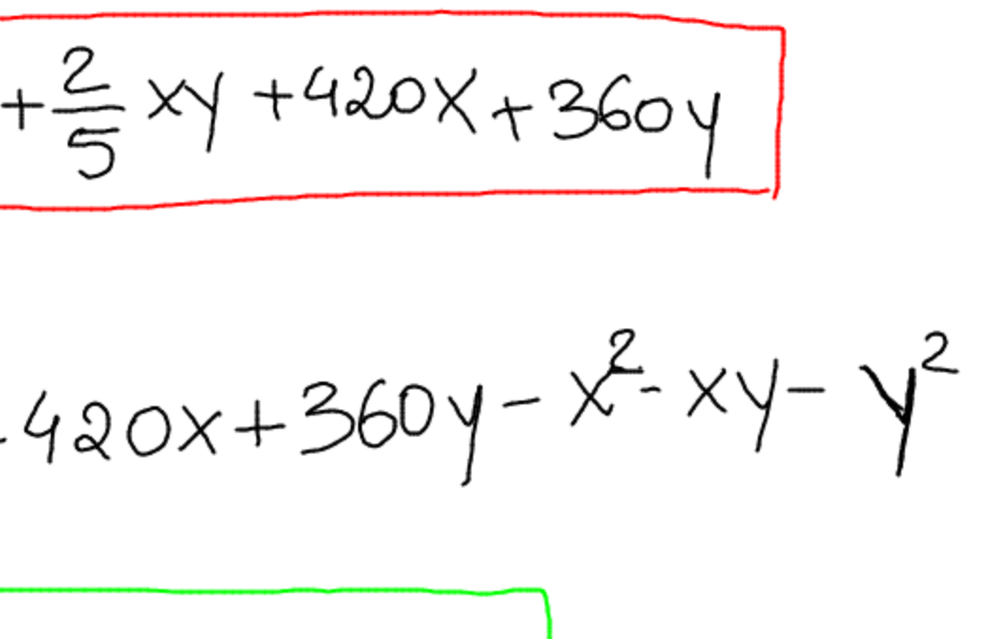
$U = -\frac{8}{5}x^2 - \frac{7}{5}(-x + 60)^2 - \frac{3}{5}x \cdot (-x + 60) + 420x + 360(-x + 60)$

$= -\frac{8}{5}x^2 - \frac{7}{5}(x^2 - 120x + 3600) + \frac{3}{5}x^2 - 36x + 420x - 360x + 21600$

$= -\frac{12}{5}x^2 + 192x + 16560$

$U' = -\frac{24}{5}x + 192$

$-\frac{24}{5}x = -192 \rightarrow x = 40$



$P1 = 400$

$P2 = 360$

$U = 20400$

Il massimo utile di 20400 € si ottiene producendo 40 u del primo bene e 20 u del secondo. I relativi prezzi sono 400 e 360 euro.