Partitions.

Two dimensional Essay.

$-xy \to \max$ such that $x + y = \frac{3}{4}$

$$\begin{bmatrix} -x \\ -y \\ 0 \end{bmatrix} = \lambda \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} \text{ with } x = y = z = -\lambda \text{ and } \frac{3}{4} = x + y$$

$\lambda = -\frac{3}{8} = x = y$

Three dimensional Essay.

$-xyz \to \max$ such that $x + y + z = \frac{3}{4} + \frac{1}{8} = \frac{7}{8}$

$$\begin{bmatrix} -x \\ -y \\ -z \\ 0 \end{bmatrix} = \lambda \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0 \end{bmatrix} \text{ with } x = y = z = -\lambda \text{ and } \frac{7}{8} = x + y + z = 3(-\lambda)$$

$\lambda = -\frac{7}{24} = x = y = z$

Four dimensional Essay.

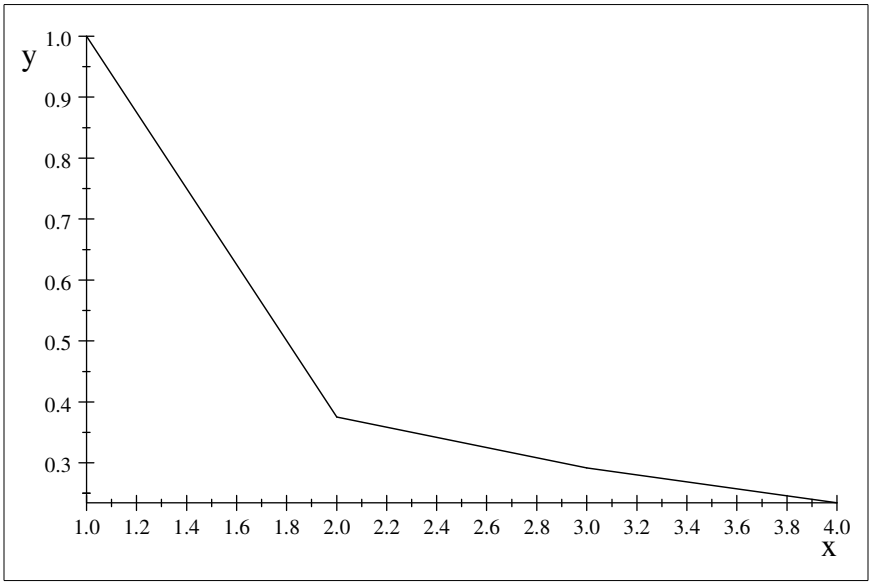
$-xyzv \to \max$ such that $x + y + z + v = \frac{3}{4} + \frac{1}{8} + \frac{1}{16} = \frac{15}{16}$

$$\begin{bmatrix} -x \\ -y \\ -z \\ 0 \end{bmatrix} = \lambda \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0 \end{bmatrix} \text{ with } x = y = -\lambda \text{ and } \frac{15}{16} = 4(-\lambda)$$

$-\lambda = -\frac{15}{240+24} = \frac{15}{64} \quad x = y = z = v = \frac{15}{64}$

We have te following results:

$$\begin{bmatrix} 1 & 1 \\ 2 & \frac{3}{8} \\ 3 & \frac{7}{24} \\ 4 & \frac{15}{64} \end{bmatrix}$$


y
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0
x