zad. 4. b) $f(x,y,z) = xy^3z^3$ $\quad x+2y+3z-a = g(x,y,z)$ $\quad a>0$

$$L(x,y,z,\lambda) = xy^3z^3 + \lambda(x+2y+3z-a)$$

$$\frac{\partial L}{\partial x} = y^3z^3 + \lambda$$

$$\frac{\partial L}{\partial y} = 3xy^2z^3 + 2\lambda$$

$$\frac{\partial L}{\partial z} = 3xy^3z^2 + 3\lambda$$

$$\frac{\partial L}{\partial \lambda} = x+2y+3z-a$$

$$\begin{cases} y^3z^3+\lambda=0 \\ 3xy^2z^3+2\lambda=0 \\ 3xy^3z^2+3\lambda=0 \\ x+2y+3z=a \end{cases} \qquad a>0$$

$\frac{y^3z^3}{3xy^2z^3} = \frac{\lambda}{2\lambda}$

1° $\lambda=0$ $\quad y^3z^3=0$ $\quad y=0 \vee z=0$

(1)+(2)−(3):

$y^3z^3 + 3xy^2z^3 - 3xy^3z^2 = 0$

$y^2z^2(yz+3xz-3xy)=0$

$y=0 \vee z=0 \vee yz+3xz-3xy=0$

$\lambda=0$ $\quad x\in\mathbb{R}$ $\quad z=\frac{a}{3}-\frac{x}{3}$

$\lambda=0$ $\quad x\in\mathbb{R}$ $\quad y=\frac{a}{2}-\frac{x}{2}$