28) $f(x,y) = xy$ $\quad [0,2]\times[0,1]$ $\quad , z = x+y$

$$\begin{cases} z = x+y \\ T = y \end{cases} \to \begin{cases} x = z-T \\ y = T \end{cases} \qquad \begin{vmatrix} \frac{dx}{dz} & \frac{dx}{dT} \\ \frac{dy}{dz} & \frac{dy}{dT} \end{vmatrix} = \begin{vmatrix} 1 & -1 \\ 0 & 1 \end{vmatrix} = 1$$

$$g(z,T) = f(x(z-t), y(T)) = (z-T)T = zT - T^2$$

$$\begin{cases} 0 < x < 2 \\ 0 < y < 1 \end{cases} \quad \begin{cases} 0 < z-t < 2 \\ 0 < t < 1 \end{cases} \to -2 < t-z < 0$$

$$\begin{cases} z-2 < t < z \\ 0 < t < 1 \end{cases}$$

$$t \in (z-2, z) \cap (0,1)$$

- $z \in [0,1]$, $t \in [0,z]$
- $z \in (1,2]$, $t \in [0,1]$
- $z \in [2,3]$, $t \in [z-2, 1]$

$$\int zt - t^2 \, dt = \frac{zt^2}{2} - \frac{t^3}{3}$$

$$g_1(z) = \begin{cases} \frac{zt^2}{2} - \frac{t^3}{3}\Big|_0^z , & z \in [0,1] \\ \frac{zt^2}{2} - \frac{t^3}{3}\Big|_0^1 , & z \in [1,2] \\ \frac{zt^2}{2} - \frac{t^3}{3}\Big|_{z-2}^1 , & z \in [2,3] \end{cases} = \begin{cases} \frac{z^3}{6} , & z \in [0,1] \\ \frac{3z-2}{6} , & z \in [1,2] \\ \frac{1}{6}(-z^3 + 15z - 13) , & z \in [2,3] \end{cases}$$

$g_1(z) \geq 0$ dla $z \in [0,3]$ ✓