

**Area:**

$$S = \int_{\psi} dS = \iint_{\psi} dy dz = \int_0^a \int_0^{y^2/a} dz dy = \frac{a^2}{3} = 3\,333 \text{ mm}^2$$

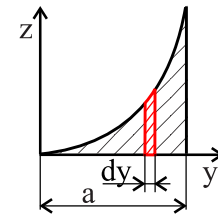
dz

Back to  
problem  
area

**First moments:**

$$U_y = \int_{\psi} z dS = \int_0^a \int_0^{y^2/a} z dz dy = \int_0^a \frac{y^4}{a^2} dy = \frac{a^3}{10} = 10^5 \text{ mm}^3$$

$$U_z = \int_{\psi} y dS = \int_0^a \int_0^{y^2/a} y dz dy = \int_0^a \frac{y^3}{a} dy = \frac{a^3}{4} = 2,5 \cdot 10^5 \text{ mm}^3$$



first  
moments

**Centre of gravity:**

$$y_T = \frac{U_z}{S} = \frac{a^3}{4} \frac{3}{a^2} = 75 \text{ mm}$$

$$z_T = \frac{U_y}{S} = \frac{a^3}{10} \frac{3}{a^2} = 305 \text{ mm}$$

centre of  
gravity