

## Een zwaartepunt

$$1. \quad M = \pi \cdot \int_0^1 x \cdot (f(x))^2 dx = \pi \cdot \int_0^1 x \cdot (\sqrt{1-x^2})^2 dx = \pi \cdot \int_0^1 x \cdot (1-x^2) dx = \pi \cdot \int_0^1 (x-x^3) dx =$$
$$\pi \cdot \left[ \frac{1}{2}x^2 - \frac{1}{4}x^4 \right]_0^1 = \pi \cdot \left( \frac{1}{2} \cdot 1^2 - \frac{1}{4} \cdot 1^4 \right) - 0 = \frac{1}{4}\pi$$

$$V = \frac{1}{2} \cdot \frac{4}{3} \pi \cdot 1^3 = \frac{2}{3} \pi$$

$$x_z = \frac{\frac{1}{4} \pi}{\frac{2}{3} \pi} = \frac{1}{4} \cdot \frac{3}{2} = \frac{3}{8}$$