

24.3

Picture

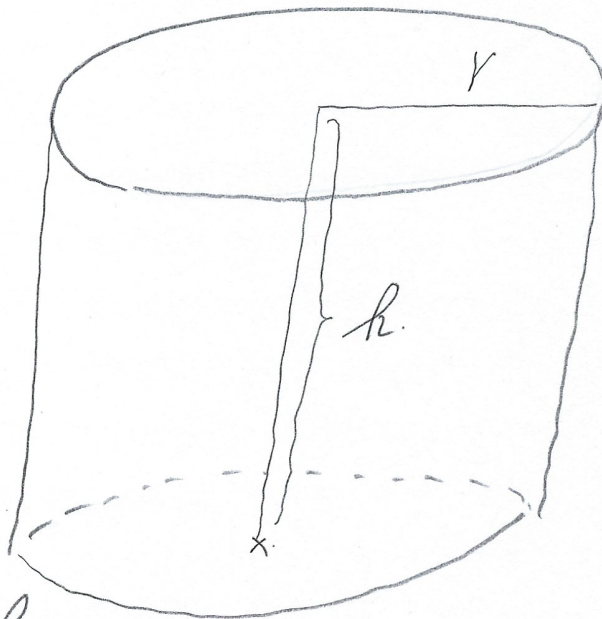
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Condition

$$\pi r^2 h = 1000$$

Objective

Minimize



$$A = 2\pi r^2 + 2\pi r \cdot h$$

$$A(r) = 2\pi r^2 + 2\pi r \cdot \frac{1000}{\pi r^2}$$

$$= 2\pi r^2 + \frac{2000}{r} \quad (0 < r)$$

Solution

$$A'(r) = 4\pi r - \frac{2000}{r^2}$$

$$= \frac{4\pi r^3 - 2000}{r^2}$$