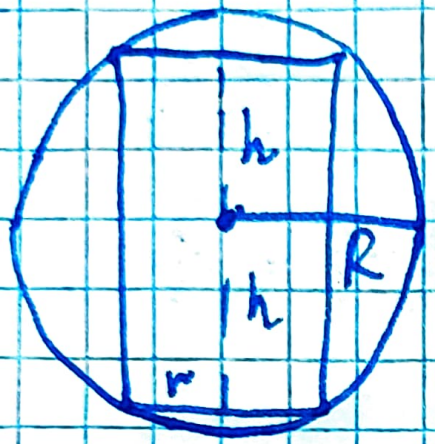
№4



$$(h+R)(R-h) = r^2$$

$$R^2 - h^2 = r^2$$

$$r^2 + h^2 = R^2$$

$$V = 2h \cdot \pi r^2 = 2h \cdot \pi \cdot (R^2 - h^2)$$

$$V = 2\pi (R^2 h - h^3)$$

$$V_h' = 2\pi R^2 - 2\pi \cdot 3h^2 = 0 \Rightarrow h^2 = \frac{2\pi R^2}{6\pi} = \frac{R^2}{3}$$

V_h': $+$ на $(0; \frac{R}{\sqrt{3}})$, $-$ на $(\frac{R}{\sqrt{3}}; +\infty)$

V: ↗ до $\frac{R}{\sqrt{3}}$, ↘ после

$$h = \frac{R}{\sqrt{3}}$$

$$V_{max} = 2 \frac{R}{\sqrt{3}} \cdot \pi \left(R^2 - \frac{R^2}{3} \right) = \frac{2\pi}{\sqrt{3}} R \cdot \frac{2R^2}{3}$$

$$V_{\text{пол}} = \frac{2\pi}{3\sqrt{3}} \cdot 2 \quad R^3 = \frac{4\pi}{3\sqrt{3}} R^3$$