

$$V = 1000 = \pi r^2 h \Rightarrow h = \frac{1000}{\pi r^2}$$

$$\begin{aligned} A &= 2\pi r h + 2\pi r^2 \\ &= \frac{2000\pi r}{\pi r^2} + 2\pi r^2 \\ &= \frac{2000}{r} + 2\pi r^2 \end{aligned}$$

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

$$A' = 0 \Rightarrow \boxed{r = 5.42 \Rightarrow h = 10.84}$$