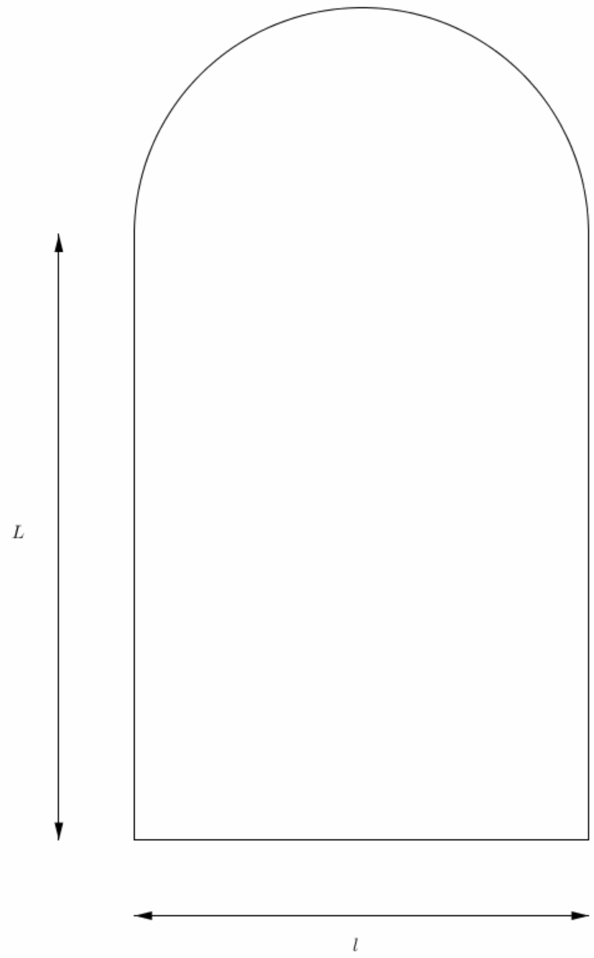

$$P = 2L + l \cdot \left(1 + \frac{\pi}{2}\right) \Rightarrow L = \frac{P}{2} - \frac{l}{2} \cdot \left(1 + \frac{\pi}{2}\right)$$

$$A = l \cdot L + \frac{\pi l^2}{8} = \frac{l}{2} \cdot \left(P - l \cdot \left(1 + \frac{3\pi}{4}\right)\right)$$

$$\frac{dA(l)}{dl} = \frac{P}{2} - l \cdot \left(\frac{\pi}{4} + 1\right)$$

On cherche $l_{\max}$ tel que $A(l_{\max})$ soit maximum :

$$\frac{dA(l = l_{\max})}{dl} = 0 \Rightarrow \frac{P}{2} = l_{\max} \cdot \left(\frac{\pi}{4} + 1\right) \Rightarrow \boxed{l_{\max} = \frac{2P}{\pi + 4}}$$