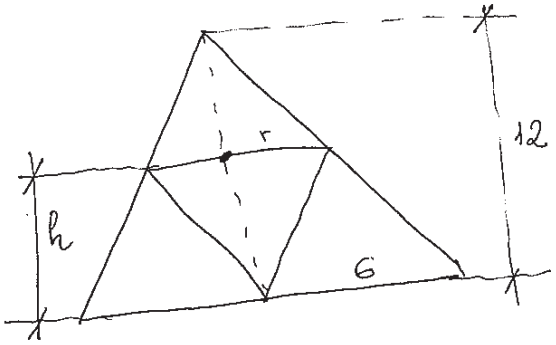
Questão 5-H



Por semelhança de triângulos:

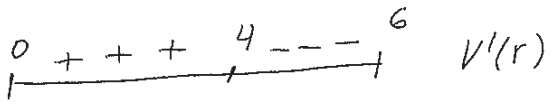
$$\frac{r}{6} = \frac{12-h}{12}$$, ou seja:

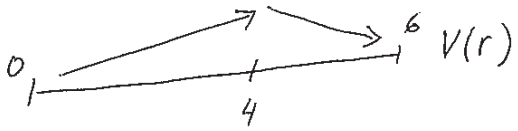
$$h = 12 - 2r$$

$$V = \frac{1}{3}\pi r^2 \cdot h \qquad 0 \le r \le 6$$

$$V = \frac{1}{3}\pi r^2 (12-2r) = -\frac{2}{3}\pi r^3 + 4\pi r^2$$

$$V'(r) = -2\pi r^2 + 8\pi r = 2\pi r(4-r)$$





Assim, $r = 4$ (e, portanto, $h = 4$) corresponde a um máximo local (e global) no intervalo $[0, 6]$

Note-se que $V(0) = V(6) = 0$.

$$V_{máx} = \frac{1}{3}\pi 4^2 \cdot 4 = \frac{64\pi}{3}\ cm^3.$$