11.15 $x^2 \geqslant 0$ et $\sqrt{1+x^3} > 0$ pour tout $x > -1$.

Donc $f(x) > 0$ pour tout $x \in \,]-1\,;0]$.

$$\lim_{\substack{t\to -1\\ t>-1}} \int_t^0 \frac{x^2}{\sqrt{1+x^3}}\,dx = \lim_{\substack{t\to -1\\ t>-1}} \tfrac{1}{3} \int_t^0 (1+x^3)^{-\frac{1}{2}} \cdot 3\,x^2\,dx = \lim_{\substack{t\to -1\\ t>-1}} \tfrac{1}{3}\,\frac{1}{\frac{1}{2}}(1+x^3)^{\frac{1}{2}}\Big|_t^0$$

$$= \lim_{\substack{t\to -1\\ t>-1}} \tfrac{2}{3}\sqrt{1+x^3}\,\Big|_t^0 = \lim_{\substack{t\to -1\\ t>-1}} \tfrac{2}{3}\sqrt{1+0^3} - \tfrac{2}{3}\sqrt{1+t^3}$$

$$= \lim_{\substack{t\to -1\\ t>-1}} \tfrac{2}{3} - \tfrac{2}{3}\sqrt{1+t^3} = \tfrac{2}{3} - \tfrac{2}{3}\sqrt{1+(-1)^3} = \tfrac{2}{3} - \tfrac{2}{3}\cdot 0 = \tfrac{2}{3}$$