1) Calcule as seguintes integrais:

(1,5) a) $\displaystyle\int \frac{dx}{(x+1)\sqrt{x+5}} \underset{\downarrow}{=} \int \frac{2udu}{(u^2-4)u} = \int \frac{2du}{(u-2)(u+2)} = \int \left[\frac{A}{u-2} + \frac{B}{u+2}\right] du = (*)$

$$\boxed{\begin{array}{rcl} u & = & \sqrt{x+5} \\ x & = & u^2-5 \\ x+1 & = & u^2-4 \\ dx & = & 2udu \end{array}}$$

$$\frac{2}{(u-2)(u+2)} = \frac{A}{u-2} + \frac{B}{u+2} = \frac{(A+B)u + 2A - 2B}{(u-2)(u+2)}$$

$$\begin{cases} A+B=0 \\ 2A-2B=2 \end{cases} \Rightarrow \begin{cases} A=1/2 \\ B=-1/2 \end{cases}$$

$$(*) = \int \left[\frac{1/2}{u-2} + \frac{-1/2}{u+2}\right] du = \frac{1}{2}\ln|u-2| - \frac{1}{2}\ln|u+2| + k =$$

$$= \frac{1}{2}\ln\left|\sqrt{x+5}-2\right| - \frac{1}{2}\ln\left|\sqrt{x+5}+2\right| + k$$

(1,5) b) $\displaystyle\int x \operatorname{arctg}(\sqrt{x^2-1})\, dx \underset{\downarrow}{=} \frac{x^2}{2}\operatorname{arctg}(\sqrt{x^2-1}) - \frac{1}{2}\int \frac{x}{\sqrt{x^2-1}}\, dx \underset{\downarrow}{=}$

$$\boxed{\begin{array}{ll} u = \operatorname{arctg}(\sqrt{x^2-1}) & du = \frac{1}{x\sqrt{x^2-1}}dx \\ dv = x\,dx & v = \frac{x^2}{2} \end{array}} \qquad \boxed{\begin{array}{l} u = x^2-1 \\ du = 2x\,dx \end{array}}$$

$$= \frac{x^2}{2}\operatorname{arctg}(\sqrt{x^2-1}) - \frac{1}{2}\int \frac{1}{2\sqrt{u}}\, du = \frac{x^2}{2}\operatorname{arctg}(\sqrt{x^2-1}) - \frac{1}{2}\sqrt{u} + k =$$

$$= \frac{x^2}{2}\operatorname{arctg}(\sqrt{x^2-1}) - \frac{1}{2}\sqrt{x^2-1} + k.$$