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Pregunta 1.

$$\int \frac{x+4}{x^2+6x+18}\,dx$$

$$\int \frac{x+4}{(x+3)^2+9}\,dx$$

$$\int \frac{(u-3)+4}{u^2+9}\,du$$

$$\int \frac{u+1}{u^2+9}\,du$$

$$\int \frac{u}{u^2+9}\,du + \int \frac{1}{u^2+9}\,du$$

$$\int \frac{1}{z}\,\frac{dz}{2} + \frac{1}{3}\tan^{-1}\left(\frac{u}{3}\right) + c$$

$$\frac{1}{2}\ln|z| + \frac{1}{3}\tan^{-1}\left(\frac{u}{3}\right) + c$$

$$\frac{1}{2}\ln|u^2+9| + \frac{1}{3}\tan^{-1}\left(\frac{u}{3}\right) + c$$

$$\frac{1}{2}\ln|(x+3)^2+9| + \frac{1}{3}\tan^{-1}\left(\frac{x+3}{3}\right) + c$$

$$\frac{1}{2}\ln|x^2+6x+18| + \frac{1}{3}\tan^{-1}\left(\frac{x+3}{3}\right) + c$$

R/ $\int \frac{x+4}{x^2+6x+18}\,dx = \boxed{\frac{1}{2}\ln|x^2+6x+18| + \frac{1}{3}\tan^{-1}\left(\frac{x+3}{3}\right) + c}$

* complemento de cuadrado

$\left(\frac{b}{2}\right)^2 = \left(\frac{6}{2}\right)^2 = 3^2 = 9$

$= x^2+6x+9-9+18$

$= (x+3)^2 + 9$

* camb. variable

$u = x+3 \qquad u-3 = x$

$du = dx$

* 2do. cambio de variable

$z = u^2+9$

$dz = 2u\,du$

$\frac{dz}{2} = u\,du$

$(x+3)^2+9$

$= x^2+6x+9+9$

$= x^2+6x+18$