$$\int \frac{3}{(x+2)\left(x^2+1\right)}dx =$$

$$\frac{3}{(x+2)\left(x^2+1\right)} = \frac{A}{x+2} + \frac{Bx+C}{x^2+1} = \frac{A\left(x^2+1\right)+\left(Bx+C\right)(x+2)}{(x+2)\left(x^2+1\right)}$$

$$3 = A\left(x^2+1\right)+\left(Bx+C\right)(x+2)$$

$$\begin{cases} x=-2 \quad \rightarrow \quad 3=5A \quad \rightarrow \quad A=\dfrac{3}{5} \\ x=0 \quad \rightarrow \quad 3=A+2C \quad \rightarrow \quad 3=\dfrac{3}{5}+2C; \quad \dfrac{12}{5}=2C; \quad C=\dfrac{6}{5} \\ x=1 \quad \rightarrow \quad 3=2A+3(B+C) \quad \rightarrow \quad 3=\dfrac{6}{5}+3\left(B+\dfrac{6}{5}\right) \end{cases}$$

$$3 = \frac{6}{5} + 3B + \frac{18}{5}$$

$$3 = \frac{24}{5} + 3B; \quad 3B = \frac{-9}{5}; \quad B = \frac{-3}{5}$$

$$\int \frac{3}{(x+2)\left(x^2+1\right)}dx = \int \frac{\frac{3}{5}}{x+2}dx + \int \frac{\frac{-3}{5}x+\frac{6}{5}}{x^2+1}dx = (*)$$

$$\int \frac{\frac{-3}{5}x+\frac{6}{5}}{x^2+1}dx = \int \frac{\frac{-3}{5}x}{x^2+1}dx + \int \frac{\frac{6}{5}}{x^2+1}dx = \frac{-3}{5}\int \frac{x}{x^2+1}dx + \frac{6}{5}\int \frac{1}{x^2+1}dx =$$

$$= \frac{-3}{5\cdot 2}\int \frac{2x}{x^2+1}dx + \frac{6}{5}\int \frac{1}{x^2+1}dx = \frac{-3}{10}Ln\left(x^2+1\right) + \frac{6}{5}arctg\ x$$

$$(*) = \frac{3}{5}Ln|x+2| + \frac{-3}{10}Ln\left(x^2+1\right) + \frac{6}{5}arctg\ x + C$$