

12.23

tisdag 20 december 2022

18:22

$$a) \int \frac{1}{x^2-4} dx = \int \frac{1}{(x-2)(x+2)} dx = \int \frac{A}{x-2} + \frac{B}{x+2} dx$$

$$1 = A(x+2) + B(x-2) = (A+B)x + 2A - 2B$$

$$A+B=0 \quad A=-B$$

$$2A-2B=1 \quad -4B=1 \quad B=-\frac{1}{4} \quad A=\frac{1}{4}$$

$$\int \frac{1}{4(x-2)} - \frac{1}{4(x+2)} dx = \frac{1}{4} \cdot \ln|x-2| - \frac{1}{4} \ln|x+2| + C = \frac{1}{4} \left(\ln \left| \frac{x-2}{x+2} \right| \right) + C$$

$$b) \int \frac{x+13}{x^2-4x-5} dx = \int \frac{x+13}{(x-5)(x+1)} dx = \int \frac{A}{x-5} + \frac{B}{x+1} dx$$

$$x+13 = A(x+1) + B(x-5) = (A+B)x + A - 5B$$

$$A+B=1 \quad A=1-B$$

$$A-5B=13$$

$$1-6B=13 \Rightarrow -6B=12$$

$$\boxed{A=3}$$

$$\boxed{B=-2}$$

$$\int \frac{3}{x-5} - \frac{2}{x+1} dx = \underline{\underline{3 \ln|x-5| - 2 \ln|x+1| + C}}$$