

$$a) \int \frac{x+1}{x^2-2x+2} dx = \int \frac{x+1}{(x-1)^2-1} dx = \left[\begin{array}{l} t=x-1, x=t+1 \\ \frac{dt}{dx}=1 \quad dt=dx \end{array} \right] =$$

$$= \int \frac{t+2}{t^2+1} dt = \int \frac{t}{t^2+1} + \frac{2}{t^2+1} dt = \frac{1}{2} \ln(t^2+1) + 2 \arctan t + C = \frac{1}{2} \ln(x^2-2x+2) + 2 \arctan(x-1) + C$$

$$b) \int \frac{x+1}{x^2+4x+5} dx = \int \frac{x+1}{(x+2)^2+1} dx = \left[\begin{array}{l} t=x+2 \quad x=t-2 \\ dt=dx \end{array} \right] = \int \frac{t-2}{t^2+1} + \frac{1}{t^2+1} dt = \arctan t + \int \frac{t}{t^2+1} - \frac{2}{t^2+1} dt = \arctan t + \frac{1}{2} \ln(t^2+1) - 2 \arctan t + C =$$

$$= -\arctan t + \frac{1}{2} \ln(t^2+1) + C = \underline{\underline{-\arctan(x+2) + \frac{1}{2} \ln(x^2+4x+5) + C}}$$