$$= \int dx - \int \frac{2x+2}{x^2+2x+1}\,dx + \int \frac{1}{x^2+2x+1}\,dx.$$

$$= \int dx - \int \frac{2x+2}{x^2+2x+1}\,dx + \int \frac{1}{(x+1)^2}\,dx.$$

$\rightarrow \frac{u'}{u}$; $\rightarrow \frac{u'}{u^n}$. avec $n=2$

$$= \int dx - \ln[x^2+2x+1] - \frac{1}{x+1} + C.$$

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

$$\boxed{I_1 = x - 2\ln(x+1) - \frac{1}{x+1} + C}$$

$$\boxed{\begin{aligned} \frac{u'}{u^2} &= -\frac{1}{2-1}\cdot\frac{1}{u^{2-1}} \\ &= -1\cdot\frac{1}{u} \\ &= \frac{-1}{u}. \end{aligned}}$$

② $I_2 = \int \frac{dx}{2x^2-5x+7} = \frac{1}{2}\int \frac{dx}{x^2-\frac{5}{2}x+\frac{7}{2}} = \frac{1}{2}\int \frac{dx}{x^2+2bx+b^2+a^2}$

$$\begin{cases} 2b = -\frac{5}{2} \Rightarrow b = -\frac{5}{4}. \\ b^2+a^2 = \frac{7}{2} \Rightarrow a^2 = \frac{31}{16} \Rightarrow a = \frac{\sqrt{31}}{4}. \end{cases}$$

$$I_2 = \frac{1}{2}\int \frac{dx}{\left(x-\frac{5}{4}\right)^2 - \frac{31}{16}} = \frac{1}{\cancel{2}}\cdot\frac{4}{\sqrt{31}}\arctan\left(\frac{x-5/4}{\sqrt{31}/4}\right) + C.$$

$$\boxed{I_2 = \frac{2}{\sqrt{31}}\arctan\left(\frac{4x-5}{\sqrt{31}}\right) + C}$$

On a:

$$(x+b)^2 + a^2 = x^2 + 2xb + b^2 + a^2.$$