Par identification des termes on a :

$$\begin{cases} A_1 + B = 0 & (1) \\ 0{,}5A_1 + A_2 + C = 0 & (2) \\ A_1 + 0{,}5A_2 = 0 & (3) \\ A_2 = 1 & (4) \end{cases}$$

Donc on va injecter (4) dans (3) : $A_1 + 0{,}5 = 0 \Leftrightarrow \boxed{A_1 = -\frac{1}{2}}$

(1) $A_1 + B = 0 \Leftrightarrow -0{,}5 + B = 0 \Leftrightarrow \boxed{B = \frac{1}{2}}$

(3) $A_1 + 0{,}5\,A_2 = 0 \Leftrightarrow 0{,}5A_2 = 0{,}5 \Leftrightarrow \boxed{A_2 = 1}$

(2) $0{,}5A_1 + A_2 + C = 0 \Leftrightarrow -0{,}25 + 1 + C = 0 \Leftrightarrow \boxed{C = -\frac{3}{4}}$

Donc $F(p) = \dfrac{1}{p^2(p^2+0{,}5p+1)} = -\dfrac{1}{2p} + \dfrac{1}{p^2} + \dfrac{1/2 \cdot p - 3/4}{p^2+0{,}5p+1}$

Soit $Y = (e^{-p}-1)^2 \times F(p) = (e^{-p}-1)^2 \times \left(-\dfrac{1}{2p} + \dfrac{1}{p^2} + \dfrac{1/2 \cdot p - 3/4}{p^2+0{,}5p+1}\right)$

Donc $Y = (1-2e^{-p}+e^{-2p}) \times \left(-\dfrac{1}{2p} + \dfrac{1}{p^2} + \dfrac{1}{2}\left(\dfrac{p - 3/2}{(p+\frac{1}{4})^2 + (\frac{\sqrt{15}}{4})^2}\right)\right)$

$$Y = (1-2e^{-p}+e^{-2p}) \times \left(-\frac{1}{2p} + \frac{1}{p^2} + \frac{1}{2}\left(\frac{p+\frac{1}{4}-\frac{7}{4}}{(p+\frac{1}{4})^2+(\frac{\sqrt{15}}{4})^2}\right)\right)$$

$$Y = (1-2e^{-p}+e^{-2p}) \times \left(-\frac{1}{2p} + \frac{1}{p^2} + \frac{1}{2}\left(\frac{p+\frac{1}{4}}{(p+\frac{1}{4})^2+(\frac{\sqrt{15}}{4})^2} - \frac{\frac{7}{4}}{(p+\frac{1}{4})^2+(\frac{\sqrt{15}}{4})^2}\right)\right)$$

$$Y = (1-2e^{-p}+e^{-2p}) \times \left(-\frac{1}{2p} + \frac{1}{p^2} + \frac{1}{2}\left(\frac{p+1/4}{(p+\frac{1}{4})^2+(\frac{\sqrt{15}}{4})^2} - \frac{7}{\sqrt{15}} \cdot \frac{\sqrt{15}/4}{(p+\frac{1}{4})^2+(\frac{\sqrt{15}}{4})^2}\right)\right)$$