$$F(s)=\frac{s^2+2s+1}{(s+3)^3\cdot s^2}$$

$$F(s)=\frac{A_1}{(s+3)}+\frac{A_2}{(s+3)^2}+\frac{A_3}{(s+3)^3}+\frac{B_1}{s}+\frac{B_2}{s^2}$$

$$f(t)=A_1\cdot e^{-3t}+A_2\cdot t\cdot e^{-3t}+A_3\cdot\frac{1}{2}\cdot t^2\cdot e^{-3t}+B_1\cdot 1(t)+B_2\cdot t$$

$$A_3=\left.\frac{(s^2+2s+1)\cdot\cancel{(s+3)^3}}{\cancel{(s+3)^3}\cdot s^2}\right|_{s=-3}=\frac{(-3)^2+2\cdot(-3)+1}{(-3)^2}=\frac{9-6+1}{9}=\frac{4}{9}$$

$$A_2=\frac{1}{1!}\cdot\frac{d}{ds}\left.\left(\frac{s^2+2s+1}{s^2}\right)\right|_{s=-3}=\left.(2s+2)\cdot s^{-2}-2\cdot s^{-3}\cdot(s^2+2s+1)\right|_{s=-3}=\frac{2\cdot(-3)+2}{(-3)^2}-2\cdot\frac{(-3)^2+2(-3)+1}{(-3)^3}=$$

$$=-\frac{4}{9}-2\cdot\frac{9-6+1}{(-27)}=-\frac{4}{9}+\frac{2\cdot 4}{27}=-\frac{12}{27}+\frac{8}{27}=-\frac{4}{27}$$

$$A_1=\frac{1}{2!}\frac{d}{ds}\left.\left([(2s+2)\cdot s^{-2}]-2\cdot s^{-3}\cdot(s^2+2s+1)\right)\right|_{s=-3}=\left[2\cdot s^{-2}-2\cdot s^{-3}\cdot(2s+2)\right]-2\left[(2s+2)\cdot s^{-3}-3\cdot s^{-4}\cdot(s^2+2s+1)\right]\Big|_{s=-3}=$$

$$=\frac{1}{2}\cdot\left[\left[\frac{2}{(-3)^2}-\frac{2}{(-3)^3}\cdot(2\cdot(-3)+2)\right]-2\cdot\left[(2\cdot(-3)+2)\cdot\frac{1}{(-3)^3}-3\cdot\frac{1}{(-3)^4}\cdot((-3)^2+2\cdot(-3)+1)\right]\right]=$$

$$=\frac{1}{2}\cdot\left[\frac{2}{9}+\frac{2\cdot(-4)}{27}-2\cdot\left(\frac{4}{27}-\frac{3\cdot(9-6+1)}{81}\right)\right]=\frac{1}{2}\cdot\left[\frac{2}{9}-\frac{8}{27}-\frac{8}{27}+\frac{24}{81}\right]=$$

$$=\frac{1}{2}\cdot\left[\frac{6}{27}-\frac{8}{27}-\cancel{\frac{8}{27}}+\cancel{\frac{8}{27}}\right]=\frac{1}{2}\cdot\left(-\frac{2}{27}\right)=-\frac{1}{27}$$

$$B_2=\left.\frac{(s^2+2s+1)\cdot\cancel{s^2}}{(s+3)^3\cdot\cancel{s^2}}\right|_{s=0}=\frac{0^2+2\times 0+1}{(0+3)^3}=\frac{1}{27}$$

$$B_1=\frac{1}{1!}\cdot\frac{d}{ds}\left.\left[(s^2+2s+1)\cdot(s+3)^{-3}\right]\right|_{s=0}=\left.\left[(2s+2)\cdot(s+3)^{-3}-3\cdot(s+3)^{-4}\cdot 1\cdot(s^2+2s+1)\right]\right|_{s=0}=$$

$$=\frac{2\cdot 0+2}{(0+3)^3}-\frac{3\cdot 1\cdot(0^2+2\cdot 0+1)}{(0+3)^4}=\frac{2}{27}-\frac{3}{81}=\frac{2}{27}-\frac{1}{27}=\frac{1}{27}$$

$$f(t)=-\frac{1}{27}\cdot e^{-3\cdot t}-\frac{4}{27}\cdot t\cdot e^{-3\cdot t}+\frac{2}{9}\cdot t^2\cdot e^{-3\cdot t}+\frac{1}{27}\cdot 1(t)+\frac{1}{27}\cdot t$$