Solution (#1713) Transforming the DE we find

$$(s^2+s)\frac{\mathrm{d}\bar{f}}{\mathrm{d}s}+(3s+2)\bar{f}=2A.$$

where $A=f(0)$. So

$$s^2(s+1)\bar{f}=As^2+B$$

where B is a constant. We then have

$$\bar{f}(s)=\frac{A}{s+1}+B\left(-\frac{1}{s}+\frac{1}{s^2}+\frac{1}{s+1}\right).$$

Hence we have

$$f(x)=Ae^{-x}+B\left(e^{-x}+x-1\right)=\alpha e^{-x}+B\left(x-1\right).$$