Problem 1.34

Express the solution of the initial-value problem

$$x\frac{d}{dx}\left(x\frac{d}{dx}-1\right)\left(x\frac{d}{dx}-2\right)\left(x\frac{d}{dx}-3\right)y(x)=f(x),\quad y(1)=y'(1)=y''(1)=y'''(1)=0,$$

as an integral.