Class 7: Problems on Recurrence Relations

1. Prove that $J_n''(x)=\frac{1}{4}\left[J_{n-2}-2J_n+J_{n+2}\right]$
2. Show that $\frac{d}{dx}\left\{xJ_n\cdot J_{n+1}\right\}=x\left[J^2{}_n-J^2{}_{n+1}\right]$
3. Prove that i) $\int xJ_0(x)dx=xJ_1(x)+c$

   ii) $\int J_1(x)dx=-J_0(x)+c$

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