Homework - MTH 357

Instructions: Homework is to be neat and organized. **If it's messy it's wrong.** Answers without the necessary supporting work are worth 0. You may discuss problems with others but must always produce your own work and write your own solutions. Copying someone else's homework is considered cheating.

HW5, due 11/2

1. Derive a formulas for $\mathscr{F}_c\{f^{(4)}(x)\}$ in terms of $\mathscr{F}_c\{f(x)\}$ and $\mathscr{F}_s\{f(x)\}$.
2. Find $\mathscr{F}_s\{f(x)\}$ for an odd function with $f(x) = \begin{cases} x & \text{if} \quad -1 < x < 1 \\ -1 & \text{if} \quad -2 < x < -1 \\ 1 & \text{if} \quad 1 < x < 2 \\ 0 & \text{if} \quad x < -2,\ x > 2 \end{cases}$.
3. Find $\mathscr{F}\{f(x)\}$, where $f(x) = e^{-|x|}$ for $-\infty < x < \infty$. (Hint: you cannot use a table for this)