Any of the following exercises are fair game for appearing in a slightly altered state on an exam. I suggest that you write up your solutions **neatly** in your own handwriting, or .tex them up, so that you can easily use them for studying later. All solutions should be your own! Feel free to discuss solutions with others, but don't write anything down that you don't understand (and write it all yourself!). **Only a subset of the problems will be graded, so do them all to the best of your ability, and be aware: even if there is only one problem that you don't do well, it might be one that's graded! So, try to do them all well!**

1. Do problem 2 on page 313 of Folland. Note that $f^{(1)}$ will exist at all points other than the x_j's. It will help to reread the text above Theorem 9.1 on page 309, and to recall Theorem 7.3 on page 208.

2. Do problem 3 on page 313 of Folland. Interpret $(gF)'$ as the distribution which satisfies $(gF)'[\phi] = F'[g\phi]$, and gF' as the distribution which satisfies $gF'[\phi] = gF[\phi']$ for all test functions $\phi \in C_0^\infty$.

3. Do problem 4 on page 313 of Folland.

4. Do problem 5 on page 313 of Folland.

5. Do problem 6 on page 313 of Folland.

6. Do problem 1 on page 319 of Folland with $n = 1$. Note that Folland does not bother to explicitly distinguish between functions and distributions! Indeed, as discussed in class, any sufficiently nice function $F : \mathbb{R} \to \mathbb{C}$ can always be identified with an associated distribution defined by $F[\phi] := \int_{-\infty}^{\infty} F(x)\phi(x)\, dx$ for all $\phi \in C_0^\infty$. You should figure it out by context using the following guidelines whether Folland is talking about a given F as a function or as a distribution: pointwise and uniform convergence always refer to regular old functions $F : \mathbb{R} \to \mathbb{C}$, while weak convergence always refers to distributions.

7. Do problem 2 on page 320 of Folland.

8. Do problems 3 and 4 on page 320 of Folland with $n = 1$.

9. Do problem 5 on page 320 of Folland with $n = 1$.

10. Do problem 7 on page 320 of Folland.