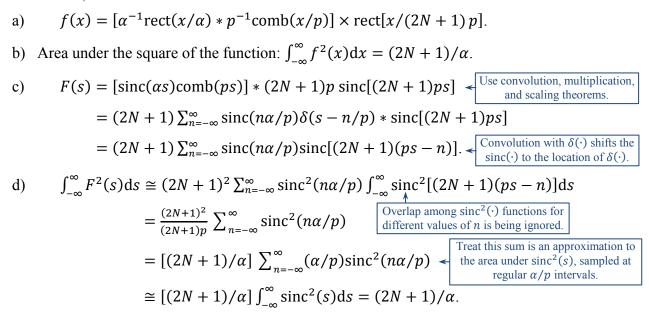
Problem 3)



e) The areas under the square of the function and the square of its Fourier transform are identical, even though both go to infinity when $\alpha \to 0$ and $N \to \infty$. Needless to say, Parseval's theorem is valid for any values of N and α , but the above argument does not demonstrate its universal validity if the adjacent sinc functions happen to have significant overlap. It is possible, however, to prove, using the same parameters as we have chosen here, that the overlap integrals between a $\operatorname{sinc}^2(\cdot)$ function and the tails of all the other $\operatorname{sinc}^2(s)$ is, in fact, exact, provided that $\alpha \leq p$.