Hints

1) I guess it can't be any more obvious by now - when you see certain operations, you need to understand the ORDER in which these operations happen; and only after you know this order, you can apply rules of FT.

This does not apply just to dilations, translations, and modulations, but to all sorts of operations: derivatives, multiplications by polynomials, complex conjugations, etc etc.

2) Even though you may think you know the correct rules that need to be applied, sometimes it happens that you CANNOT apply them.

For example, it may happen that one of the functions in the convolution is not integrable, and so its FT will make no sense.

On the other hand a convolution of an integrable function with a non-integrable function may, very well, be an integrable function, and taking the FT of this makes sense. So, in such case, you need to find out what is exactly the formula of the convolution as a function written explicitely, and then apply the FT by computing the appropriate integral.

2.5) The following statement is NOT a rigorous theorem, but it is a very good approximation of one:

"All FT and Laplace computations are about your ability to integrate by means of integration by parts."

3) It is not the end of the world if you confuse the Fourier coefficients with the Fourier transform, but still it is better not to confuse them.

Also, make sure you write the involved integral correctly, by appropriately choosing the domain of integration.

4) You are the world leading experts in Laplace transforms and their applications to solve certain DE's. What else can I say here?

5) Just in case, remember that a convolution for Laplace transform was defined differently than the convolution for FT.

7) A 4 by 4 Discrete Haar Transform is a matrix with 4 rows and 4 columns, and it consists of two 2x4 halfs - upper, which we called H and lower, which we called G. When you apply a 4x4 matrix to a vector, the result of this operation should be a vector with 4 coefficients!

8) Look also at your old HWs, Extra HWs, midterms and midterm reviews. Divide problems in groups, and try to understand the main methods, as well as subtle points you learned while solving these problems.

9) Get a good night sleep on Sunday!