CAAM 499 HW 3. DUE BY 11AM MONDAY 10/2

Textbook exercises in chapter 3:

Exercise 1 (Hint: Write the function as $f = \mathcal{F}^{-1}\mathcal{F}f$; what does $\mathcal{F}$ do to a convolution?)

Exercise 4 (Hint: Don't do it directly; try using the properties on page 34)

Exercise 5

Exercise 11 (Hint: Try using $\mathcal{F}(f \star g)(\xi) = \hat{f}(\xi)\hat{g}(\xi)$ and plugging in a special value of ξ)

Exercise 12

Exercise 18 (Hint: You can use exercise 19 for this since we did it in class. Try setting $g = f$ in that exercise to get another useful formula))

Bonus: Exercise 16 (Hint: You can compute $\mathcal{F}(e^{-x^2/2})$ by plugging in a special value of t when we computed $G_t(x)$ in class)

Bonus: Exercise 8 (Hint: Use the change of variables formula and use that $R_\theta(x) \cdot \xi = x \cdot R_{-\theta}\xi$)