Assignment 5: Complex analysis Part 2

(All questions from Saff and Snider are from the third edition)

1. Exercise 4.5 Saff and Snider Q3, Q4, Q6

2. Exercise 5.5 Saff and Snider Q4, Q6.

3. Exercise 5.6 Q 1, Q3, Q6, Saff and Snider.

4. Exercise 6.1 Saff and Snider Q1, Q2, Q3.

5. Exercise 6.2 Saff and Snider Q1, Q4.

6. Exercise 6.3 Saff and Snider Q1, Q7.

7. Exercise 6.4 Saff and Snider Q4, Q6, Q10.

8. Exercise 6.5 Saff and Snider Q2, Q5.

9. Exercise 6.6 Saff and Snider Q1, Q4, Q8.

10. Exercise 7.3 Saff and Snider Q3, Q5.

11. Find the Fourier Transform of $e^{-a|x|}$ where $a > 0$ is a positive real constant.

12. Consider the one dimensional heat equation

$$\frac{\partial u(x,t)}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2}, t > 0$$

$$u(x,0) = f(x)$$

    and

$$u(x,t) \to 0 \ as \ |x| \to \infty$$

    Taking Fourier transform of $u(x,t)$ with respect to x alone, solve this problem.

13. Find a Green's function for the Helmholtz equation in two dimensions.