MATH 618 (Phillips) Sp 2025 NAME: _____

STUDENT ID: _____

QUESTIONNAIRE

This questionnaire is due on Tuesday 20 May on Canvas.

What are your mathematical interests? ("Don't know yet" or "everything" are acceptable answers.)

What is your stage in the program? (Anything from "still just taking courses" to "I already have an advisor and I am already working on a research problem".)

How long have you been in the program so far?

What other courses are you taking now?

Do you expect to take the analysis qualifying exam?

How often do you look at this course on Canvas?

How often do you check email?

For the last part of the course, which possible topics are you interested in? You are not restricted to the possibilities listed, but I won't be able to present topics requiring background other students don't have. The numbers of lectures required are to some extent guesswork. The available time limits how many topics can be done. (On demand, I can continue for a lecture or two into finals week. I have done this in the past for the Prime Number Theorem.)

- Riemann Mapping Theorem (4–5 days).
- Weierstrass factorization and related (3 days).
- Proof of the Prime Number Theorem, without using the Γ function or proving the functional equation for the ζ function (4 days).
- Addition to the previous item: Γ function and functional equation for the ζ function (at least two days).
- Holomorphic functional calculus for elements of Banach algebras (4 days). Recall (briefly mentioned in class) that if A is a unital Banach algebra and $a \in A$, then $\mathrm{sp}(a)$ is the set of $\lambda \in \mathbb{C}$ such that $\lambda \cdot 1 - a$ is not invertible. (The set of eigenvalues of a if $A = M_n(\mathbb{C})$.) Holomorphic functional calculus makes sense of $f(a)$ when f is a holomorphic function defined on a neighborhood of $\mathrm{sp}(a)$.
- Other?

(Optional) What course are you teaching now?