# Math 428 – Midterm 1 Study Topics

**Section 3.5**: Maximum modulus theorem for analytic functions. Examples similar to homework.

**Section 4.1**: Chains and cycles, index of a cycle at $z$. Definition of adding and subtracting cycles. Recognize when collection of paths form a cycle; evaluate the index for simple examples.

**Section 4.2**: Cauchy's Theorem, Cauchy Integral Formula (sometimes Cauchy Integral Formula is easier to use than Residue Theorem to evaluate an integral).

**Section 4.3**: Laurent series (on punctured discs): find coefficients, find principal parts (only for simple or double poles).

**Section 4.4**: Residue Theorem, find residues, evaluate contour integrals over simple paths.

**Section 4.5**: Counting zeroes and poles, Rouche's Theorem.