## REVIEW FOR MAT 342 MIDTERM 1
## (SECTION 1–22 IN THE TEXTBOOK)

- Definition of complex numbers, their real and imaginary parts, absolute value and argument
- Complex conjugate, complex numbers in polar form, exponential function, Euler's formula, $\exp(z+w) = \exp z \exp w$
- Roots of complex numbers
- Neighborhood of a complex number, deleted neighborhoods, neighborhood of $\infty$
- Open and closed sets, boundaries, connected sets, domains, regions and accumulation points
- Functions of a complex variable, polynomials and rational functions, mappings (with examples of $w = z^2$ and $w = \exp z$)
- Limits and continuity, limits at $\infty$
- Derivatives, Cauchy-Riemann equations
- Rules for differentiation: derivatives of sum, difference, product and quotient of functions, chain rule