Review Calculus & Linear Algebra
to Get Prepared for Math 2552 Differential Equations

What do we need?

- **Pre-Calculus:** roots of quadratic polynomials, roots of simple higher degree polynomials, inequalities, functions, graphs.
- **Elementary Functions:** linear functions, polynomials, rational functions, cos, sin, tan, cot, exp, ln.
- **Derivatives:** tangent lines, rate of change, product rule, quotient rule, chain rule, increasing and decreasing functions, graph sketches.
- **Integrals:** substitution, integration by parts, partial fraction.
- **Complex Numbers & Functions:** real part, imaginary part, modulus, argument angle, rectangular form, polar form, complex exp, Euler's formula.
- **Linear Algebra:** matrix multiplication, row reduction, solve $A\vec{\mathbf{x}} = \vec{\mathbf{b}}$, determinant, eigenvalues, eigenvectors, eigenspaces, diagonalization.
- **Vector Calculus:** vector functions, parametrizations of curves, tangent lines.
- **Multivariable Calculus:** partial derivatives, Jacobian matrix.