

Topics need to be reviewed before starting course MATH 254

- 1) The concept of limits.
 - i. Evaluate the limit at real number a or at infinity for a function.
 - ii. Properties of Limit and Sandwich Theorem.
 - iii. Indeterminate form and L'Hopital's rule.

- 2) Sequences and Series:
 - i. Definition of a Sequence and a Series.
 - ii. Limit of a sequence and a series.
 - iii. Taylor polynomials and series.

- 3) Differentiability, the derivative of a function (polynomials, $\cos(x)$, $\sin(x)$, $\tan(x)$, $\ln(x)$, e^x , a^x , f/g , $f \times g$, $f \pm g$, $(f(x))^a$, $f(g(x))$).

- 4) Integration, the properties of integration and Weighted Mean Value Theorem for integrals (Theorem 1.13).

- 5) Maximum and Minimum:
 - i. Definition of Maximum and Minimum of a function.
 - ii. Extreme Value Theorem (Theorem 1.9)
 - iii. Finding $\max f(x)$, $\min f(x)$ and $\max |f(x)|$, $\min |f(x)|$ on \mathbb{R} and on closed interval $[a, b]$.
 - iv. Maximum and Minimum of increasing and decreasing functions.
 - v. Intermediate value Theorem (Theorem 1.11).

- 6) Linear System
 - i. Solving linear system using Gaussian elimination.
 - ii. Evaluating the product and sum of matrices.
 - iii. Computing the determinant of a matrix.
 - iv. Computing the inverse of a matrix.