Matrix Multiplication

1. Inner Product (Row by column)
   a) Given two matrices A and B, the (i, j) entry of AB is the inner product of row i of A and column j of B
2. Linear combination of columns
3. Linear combination of rows
4. Summation of matrices (Column by row)
   a) $AB = a_1 b_1^T + a_2 b_2^T + \cdots + a_n b_n^T$
5. Block Multiplication
   a) Multiply as the small matrices are scalars
   b) Matrix multiplication is the composition of two linear functions
6. Symmetric Matrix
   a) $A^T = A$
   b) AA^T and $A^T A$ are square and symmetric