5.1.3 What you will Learn

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Upon completion of this unit, you should be able to

- Recognize that matrix-matrix multiplication is not commutative.
- Relate composing rotations to matrix-matrix multiplication.
- Fluently compute a matrix-matrix multiplication.
- Perform matrix-matrix multiplication with partitioned matrices.
- Identify, apply, and prove properties of matrix-matrix multiplication, such as $(AB)^T = B^T A^T$.
- Exploit special structure of matrices to perform matrix-matrix multiplication with special matrices, such as identity, triangular, and diagonal matrices.
- Identify whether or not matrix-matrix multiplication preserves special properties in matrices, such as symmetric and triangular structure.
- Express a matrix-matrix multiplication in terms of matrix-vector multiplications, row vector times matrix multiplications, and rank-1 updates.
- Appreciate how partitioned matrix-matrix multiplication enables high performance. (Optional, as part of the enrichment.)