# METRIC TENSOR: TRACE

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Reference: Moore, Thomas A., *A General Relativity Workbook*, University Science Books (2013) - Chapter 6; Problems 4.5, 6.5.

A specific case of the trace of a tensor is the trace of the metric tensor, which is given by $g_{ij}g^{ij}$. Since $g^{ij}$ is the inverse of the metric tensor $g_{ij}$, $g_{ik}g^{kj} = \delta^j{}_i$ is the identity matrix, which means it is diagonal with every diagonal element equal to 1. The trace of the identity matrix is simply $n$, the dimension of the matrix. Thus in 2-d it would be $n = 2$ and so on.