

0.1 Positive-definite matrices

The matrix M is positive definite if for all non-zero vectors the scalar is positive.

$$v^T M v$$

We know that the outcome is a scalar, so:

$$v^T M v = (v^T M v)^T$$

$$v^T M v = v^T M^T v$$

$$v^T (M - M^T) v = 0$$