

## PROBLEM SET 1

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Let  $A = (a_{ij})$  be a symmetric  $n \times n$  matrix. Prove that the differential operator

$$L_A = \sum_{i,j=1}^n a_{ij} \frac{\partial^2}{\partial x_i \partial x_j}$$

is rotationally invariant if and only if the matrix  $A$  is a multiple of the identity matrix (that means that the operator  $L_A$  is a multiple of the Laplacian.)

Problems from Evans: 2, 3 on p. 12; 3, 4, 5, 9 on p.p. 85–87