

**Homework Set 6. Due Friday October 7 at 10.30 am**

1. Do exercise A.15 of GS.
2. Diagonalize the quadratic form

$$x^2 - 2y^2 + z^2 + 4xy - 6xz + 2yz. \quad (1)$$

What are the eigenmodes?

3. Show that the outer product of two vectors  $\vec{a}$  and  $\vec{b}$  in 3 dimensions is invariant under rotations. Use this to show that  $|\vec{a} \times \vec{b}|$  is equal to the area spanned by  $\vec{a}$  and  $\vec{b}$ .