4 ) Let be the implicit surface defined by . Formally prove that the normal of at point is proportional to .

**Proof**: Assume normal of point is not parallel to the derivative of evaluated at .

We'll take , where is a point on .

We'll define , which lies on some plane, that a normal is at distance from ; what makes it orthogonal to gradient of k.

So, the implicit function for p is:

As said above, k is orthogonal to , so thus and lie on the same 3d-surface.