Prove that $dx \wedge dx = dy \wedge dy = dz \wedge dz = 0$.

Let $\phi = f_1 dx + f_2 dy + f_3 dz$ and $\psi = g_1 dx + g_2 dy + g_3 dz$. Calculate the wedge products $\phi \wedge \psi$ and $\psi \wedge \phi$. 