Physics 4674/5674 – Problem set 7

4674 & 5674:

1. A symmetric (0,2) tensor $K_{\mu\nu}$ is said to be a Killing tensor if

$$\nabla_\mu K_{\nu\rho} + \nabla_\nu K_{\rho\mu} + \nabla_\rho K_{\mu\nu} = 0$$

Show that if X, Y are Killing vectors, then $K_{\mu\nu} \equiv X_\mu Y_\nu + X_\nu Y_\mu$ is a Killing tensor.

2. C 4.3 (There is a typo in (4.159): the integration should be over the worldline of the particle, not the spacetime M.)

3. C 5.4(a)