

# Homework problems #6

1. Show that

$$T^{\mu\sigma}{}_{\lambda;\rho} = \frac{\partial}{\partial x^\rho} T^{\mu\sigma}{}_\lambda + \Gamma_{\rho\nu}^\mu T^{\nu\sigma}{}_\lambda + \Gamma_{\rho\nu}^\sigma T^{\mu\nu}{}_\lambda - \Gamma_{\lambda\rho}^\kappa T^{\mu\sigma}{}_\kappa$$

is a tensor for general coordinate transformations.

2. Prove that the Leibniz rule holds for covariant differentiation of a product of two tensors:

$$(A^\mu{}_\nu B^\lambda)_{;\rho} = A^\mu{}_{\nu;\rho} B^\lambda + A^\mu{}_\nu B^\lambda{}_{;\rho}$$