

How is 7.3.13 compatible with 7.3.13b?

$$7.3.11 \Rightarrow \cancel{7.3.10} \Rightarrow \nabla_x z = \cancel{\nabla_x z} + [x, z]$$

$$7.3.11 \Rightarrow Xg(Y, z) + Yg(X, z) - Zg(X, Y)$$

$$= g(\nabla_x Y, z) + g(\nabla_x z, Y)$$

$$+ g(\nabla_Y X, z) + g(\nabla_Y z, X)$$

$$- \cancel{g(Y, X)}$$

$$- \cancel{g(X, Y)}$$

$$- g(\nabla_z X, Y) - g(\nabla_z Y, X)$$

$$= g(\nabla_x Y, z) + g(\cancel{\nabla_z X}, Y) + g([X, z], Y)$$

$$+ g(\nabla_x Y, z) + g([X, Y], z)$$

$$+ g(\cancel{\nabla_z Y}, X) + g(\cancel{[Y, z]}, X)$$

$$- g(\cancel{\nabla_z X}, Y) - g(\cancel{\nabla_z Y}, X)$$

$$= 2g(\nabla_x Y, z) + g([X, z], Y)$$

$$+ g([X, Y], z) + g([Y, z], X)$$

or is $[,]$
the Lie bracket
symmetric?

think should be
 $[X, z]$ not
 $[z, X]$!