

Exercise 2.7 Selective kill

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1 {a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u#}::Indices(position=independent).
2
3 \partial{#}::PartialDerivative.
4
5 hide    := \partial_{c d}{g_{a b}} -> Z_{c d a b}.
6 reveal  := Z_{c d a b} -> \partial_{c d}{g_{a b}}.
7
8 kill    := \partial_{c}{g_{a b}} -> 0.
9
10 Aab := g_{a b} + \partial_{c}{g_{a b}} x^c
11      + \partial_{c d}{g_{a b}} x^c x^d.      # cdb (ex-0207.101,Aab)
12
13 substitute (Aab,hide)                    # cdb (ex-0207.102,Aab)
14 substitute (Aab,kill)                    # cdb (ex-0207.103,Aab)
15 substitute (Aab,reveal)                  # cdb (ex-0207.104,Aab)

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$$\begin{aligned}
 A_{ab} &= g_{ab} + \partial_c g_{ab} x^c + \partial_{cd} g_{ab} x^c x^d & (\text{ex-0207.101}) \\
 &= g_{ab} + \partial_c g_{ab} x^c + Z_{cdab} x^c x^d & (\text{ex-0207.102}) \\
 &= g_{ab} + Z_{cdab} x^c x^d & (\text{ex-0207.103}) \\
 &= g_{ab} + \partial_{cd} g_{ab} x^c x^d & (\text{ex-0207.104})
 \end{aligned}$$