Exercise 2.7 Selective kill

```
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_{d}{\Gamma^{a}_{b c}} -> Z_{d a b c}.
6   reveal := Z_{d a b c} -> \partial_{d}{\Gamma^{a}_{b c}}.
7
8   kill := \Gamma^{a}_{b c} -> 0.
9
10  Gamma := \Gamma^{a}_{b c}
11         + x^{d} \partial_{d}{\Gamma^{a}_{b c}}.        # cdb (ex-0207.101,Gamma)
12
13  substitute (Gamma,hide)                              # cdb (ex-0207.102,Gamma)
14  substitute (Gamma,kill)                              # cdb (ex-0207.103,Gamma)
15  substitute (Gamma,reveal)                            # cdb (ex-0207.104,Gamma)
```

$$\Gamma^a{}_{bc}(x) = \Gamma^a{}_{bc} + x^d \partial_d \Gamma^a{}_{bc} \qquad \text{(ex-0207.101)}$$

$$= \Gamma^a{}_{bc} + x^d Z_{dabc} \qquad \text{(ex-0207.102)}$$

$$= x^d Z_{dabc} \qquad \text{(ex-0207.103)}$$

$$= x^d \partial_d \Gamma^a{}_{bc} \qquad \text{(ex-0207.104)}$$

Exercise 2.7 Naive kill

```
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{#}::Derivative.
4
5   kill := \Gamma^{a}_{b c} -> 0.
6
7   Gamma := \Gamma^{a}_{b c}
8           + x^{d} \partial_{d}{\Gamma^{a}_{b c}}.        # cdb (ex-0207.201,Gamma)
9
10  substitute (Gamma,kill)                               # cdb (ex-0207.202,Gamma)
```

$$\Gamma^a{}_{bc}(x) = \Gamma^a{}_{bc} + x^d \partial_d \Gamma^a{}_{bc} \qquad \text{(ex-0207.201)}$$

$$= 0 \qquad \text{(ex-0207.202)}$$

Exercise 2.7 No problem killing partial derivatives

```
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   kill := \partial_{c}{A_{a b}} -> 0.
6
7   Aab := A_{a b} + x^{c} \partial_{c}{A_{a b}}
8              + x^{c} x^{d} \partial_{d}{\partial_{c}{A_{a b}}}.    # cdb (ex-0207.301,Aab)
9
10  substitute (Aab,kill)                                           # cdb (ex-0207.302,Aab)
```

$$A_{ab}(x) = A_{ab} + x^c \partial_c A_{ab} + x^c x^d \partial_{dc} A_{ab} \qquad \text{(ex-0207.301)}$$

$$= A_{ab} + x^c x^d \partial_{dc} A_{ab} \qquad \text{(ex-0207.302)}$$