## Example 5a Keeping focused

```
{a,b,c,d,e,f,h,i,j,k,l,m,n,o,p,q,r,s,t,u#}::Indices.

expr := A_{a} v^{a} + B_{a} v^{a} + C_{a} v^{a}. # cdb (ex-05.100,expr)

zoom (expr,$B_{a} Q??$) # cdb (ex-05.101,expr)

substitute (expr, $v^{a} -> w^{a}$) # cdb (ex-05.102,expr)

unzoom (expr) # cdb (ex-05.103,expr)

checkpoint.append (expr)
```

$$A_a v^a + B_a v^a + C_a v^a = \dots + B_a v^a + \dots$$
 (ex-05.101)  
=  $\dots + B_a w^a + \dots$  (ex-05.102)  
=  $A_a v^a + B_a w^a + C_a v^a$  (ex-05.103)

## Example 5b Tags

```
{a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u\#}::Indices(position=independent).
     def add_tags (obj,tag):
        n = 0
        ans = Ex('0')
       for i in obj.top().terms():
          foo = obj[i]
           bah = Ex(tag+'_{i}'+str(n)+')'
           ans := @(ans) + @(bah) @(foo).
           n = n + 1
10
        return ans
11
12
     def clear_tags (obj,tag):
13
        ans := @(obj).
14
       foo = Ex(tag+'_{a?} -> 1')
15
        substitute (ans,foo)
16
        return ans
17
18
     expr := 2 V_{p q} - 3 V_{q p}.
                                                        # cdb (ex-05.200,expr)
19
20
     expr = add_tags (expr,'\\mu')
                                                        # cdb (ex-05.201,expr)
21
22
                (expr, $\mu_{1} Q??$)
                                                        # cdb (ex-05.202,expr)
     zoom
     substitute (expr, $V_{a b} -> - V_{b a}$)
                                                        # cdb (ex-05.203,expr)
                                                        # cdb (ex-05.204,expr)
                (expr)
     unzoom
26
     expr = clear_tags (expr, '\\mu')
                                                        # cdb (ex-05.205,expr)
27
28
     checkpoint.append (expr)
```

$$\begin{array}{lll} 2V_{pq} - 3V_{qp} &= 2\mu_0 V_{pq} - 3\mu_1 V_{qp} & & (\text{ex-05.201}) \\ &= \dots - 3\mu_1 V_{qp} & & (\text{ex-05.202}) \\ &= \dots + 3\mu_1 V_{pq} & & (\text{ex-05.203}) \\ &= 2\mu_0 V_{pq} + 3\mu_1 V_{pq} & & (\text{ex-05.204}) \\ &= 5V_{pq} & & (\text{ex-05.205}) \end{array}$$