```
In[•]:= 1 + 1
Out[•]= 2

In[•]:= K = PD[Xp[3, 1, 4, 6], Xp[1, 5, 2, 4], Xp[5, 3, 6, 2]]
Out[•]= PD[Xp[3, 1, 4, 6], Xp[1, 5, 2, 4], Xp[5, 3, 6, 2]]

In[•]:= K
Out[•]= PD[Xp[3, 1, 4, 6], Xp[1, 5, 2, 4], Xp[5, 3, 6, 2]]

In[•]:= t1 = K /. {Xp[i_, j_, k_, l_] :> A p[i, j] p[k, l] + A^-1 p[i, l] p[j, k]}
Out[•]= PD[p[1, 4] p[3, 6]/A + A p[3, 1] p[4, 6],
  A p[1, 5] p[2, 4] + p[1, 4] p[5, 2]/A, p[3, 6] p[5, 2]/A + A p[5, 3] p[6, 2]]

In[•]:= Times @@ t1
Out[•]= (p[1, 4] p[3, 6]/A + A p[3, 1] p[4, 6])
  (A p[1, 5] p[2, 4] + p[1, 4] p[5, 2]/A) (p[3, 6] p[5, 2]/A + A p[5, 3] p[6, 2])

In[•]:= t2 = Expand[Times @@ t1]
Out[•]= p[1, 4] p[1, 5] p[2, 4] p[3, 6]^2 p[5, 2]/A +
  A p[1, 5] p[2, 4] p[3, 1] p[3, 6] p[4, 6] p[5, 2] + p[1, 4]^2 p[3, 6]^2 p[5, 2]^2/A^3 +
  p[1, 4] p[3, 1] p[3, 6] p[4, 6] p[5, 2]^2/A + A p[1, 4] p[1, 5] p[2, 4] p[3, 6] p[5, 3] p[6, 2] +
  A^3 p[1, 5] p[2, 4] p[3, 1] p[4, 6] p[5, 3] p[6, 2] +
  p[1, 4]^2 p[3, 6] p[5, 2] p[5, 3] p[6, 2]/A + A p[1, 4] p[3, 1] p[4, 6] p[5, 2] p[5, 3] p[6, 2]

In[•]:= t3 = t2 //. {p[i_, j_] p[j_, k_] :> p[i, k]}
Out[•]= A p[1, 4]^2 + A^3 p[2, 2] p[3, 3] + A p[3, 6]^2 + p[1, 4]^2 p[3, 6]^2/A +
  A p[5, 2]^2 + p[1, 4]^2 p[5, 2]^2/A + p[3, 6]^2 p[5, 2]^2/A + p[1, 4]^2 p[3, 6]^2 p[5, 2]^2/A^3

In[•]:= t4 = t3 /. {p[i_, i_] → (-A^2 - A^-2), p[i_, j_]^2 → (-A^2 - A^-2)}
Out[•]= 3 A (-1/A^2 - A^2) + 3 (-1/A^2 - A^2)^2/A + A^3 (-1/A^2 - A^2)^2 + (-1/A^2 - A^2)^3/A^3

In[•]:= Expand[t4]
Out[•]= -1/A^9 + 1/A + A^3 + A^7
```