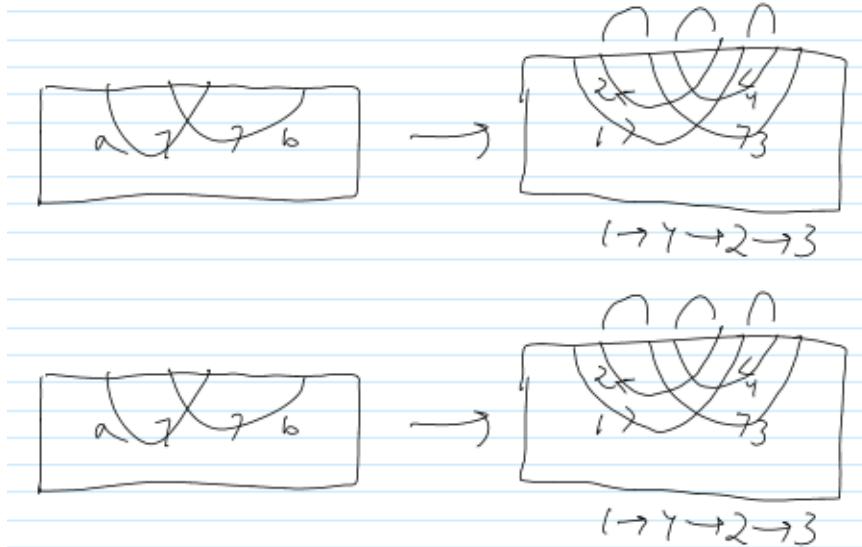


Pensieve Header: An attempt on the genus property using Γ -calculus and the C2 divisibility property - higher genera.

```
dir = SetDirectory["C:/drorbn/AcademicPensieve/2014-06/"];
<< MetaCalculi/MetaCalculi-Program.m
Format[ $\alpha_{a,b}$ , StandardForm] := Interpretation[ $\alpha_{ToString[a]<>ToString[b]}$ ,  $\alpha_{ab}$ ];
Format[ $\sigma_{a,b}$ , StandardForm] := Interpretation[ $\sigma_{ToString[a]<>ToString[b]}$ ,  $\sigma_{ab}$ ];
RSimp = (# // Together // ExpandDenominator // ExpandNumerator) &
ExpandNumerator[ExpandDenominator[Together[##1]]] &
```



```
g = 1;
vars = Table[Ta[i], {i, 2 g}]; vars = {};
γ0 =

$$\Gamma \left[ \omega @\!@ \text{vars}, \sum_{i=1}^{2g} h_a[i] \prod_{j=1}^{2g} T_a[j]^{\sigma_{j,i}}, \text{Sum}[t_a[i] h_a[j] (T_a[i] - 1) \alpha_{i,j} @\!@ \text{vars}, \{i, 2g\}, \{j, 2g\}] + \right.$$


$$\left. \sum_{i=1}^{2g} t_a[i] h_a[i] \prod_{j=1}^{2g} T_a[j]^{\sigma_{j,i}} \right] /. \alpha_[] \Rightarrow \alpha$$


$$\begin{pmatrix} \omega & s_{a[1]} & s_{a[2]} \\ s_{a[1]} & T_{a[1]}^{\sigma_{11}} T_{a[2]}^{\sigma_{21}} - \alpha_{11} + T_{a[1]} \alpha_{11} & -\alpha_{12} + T_{a[1]} \alpha_{12} \\ s_{a[2]} & -\alpha_{21} + T_{a[2]} \alpha_{21} & T_{a[1]}^{\sigma_{12}} T_{a[2]}^{\sigma_{22}} - \alpha_{22} + T_{a[2]} \alpha_{22} \\ \Sigma & T_{a[1]}^{\sigma_{11}} T_{a[2]}^{\sigma_{21}} & T_{a[1]}^{\sigma_{12}} T_{a[2]}^{\sigma_{22}} \end{pmatrix}$$


```

```

γ1 = γ0 (ε[0] // Γ);
Do[
  γ1 =
    γ1 // qΔ[a[2 i - 1], 4 i - 3, 4 i - 2] // dm[0, 4 i - 3, 0] // qΔ[a[2 i], 4 i - 1, 4 i] //
      ds[4 i] // dm[0, 4 i, 0] //
      ds[4 i - 2] // dm[0, 4 i - 2, 0] // dm[0, 4 i - 1, 0],
  {i, g}];
γ1


$$\left( \begin{array}{ccc} \frac{\omega T_0^2 - \omega T_0 \alpha_{12} + \omega T_0^2 \alpha_{12} + \omega T_0 \alpha_{21} - \omega T_0^2 \alpha_{21} - \omega \alpha_{12} \alpha_{21} + 2 \omega T_0 \alpha_{12} \alpha_{21} - \omega T_0^2 \alpha_{12} \alpha_{21} + \omega \alpha_{11} \alpha_{22} - 2 \omega T_0 \alpha_{11} \alpha_{22} + \omega T_0^2 \alpha_{11} \alpha_{22}}{T_0^2} & s_0 & 1 \\ s_0 & \Sigma & 1 \\ \end{array} \right)$$


g = 2;
vars = Table[Ta[i], {i, 2 g}]; vars = {};
γ0 = Γ[w @@ vars, Sum[h_a[i] Product[Ta[j]^σ_{j,i}, {j, 1, 2 g}], {i, 1, 2 g}] + Sum[t_a[i] h_a[i] (Ta[i] - 1) α_{i,j} @@ vars, {i, 2 g}, {j, 2 g}] /. α_[] :> α;

γ1 = γ0 (ε[0] // Γ);
Do[
  γ1 =
    γ1 // qΔ[a[2 i - 1], 4 i - 3, 4 i - 2] // dm[0, 4 i - 3, 0] // qΔ[a[2 i], 4 i - 1, 4 i] //
      ds[4 i] // dm[0, 4 i, 0] //
      ds[4 i - 2] // dm[0, 4 i - 2, 0] // dm[0, 4 i - 1, 0],
  {i, g}];
γ1

```

\$Aborted

A very large output was generated. Here is a sample of it:

(<<1>>)

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