Pensieve header: Normally Ordered Exponentials at 0-Co in the t variables.

"NO" for “Normal Order”.

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𝔼 /: 𝔼[Q1_] 𝔼[Q2_] := Simp@𝔼[Q1 + Q2]
```

```
Simp[ω_. 𝔼[Q_]] := ExpandDenominator[ω] 𝔼[ω Expand@Cancel[Q / ω]];
ω1_. 𝔼[Q1_] ≡ ω2_. 𝔼[Q2_] := Together[ω1 - ω2] == 0 ⋀ Together[Q1 - Q2] == 0;
brule = {b → Log[t], b_ :↦ Log[t_]};
```

```
NO[u_, c_, k_][ω_. 𝔼[Q_]] := Simp@Module[
    {α = ∂c Q, β = ∂u Q, Θ = Q /. c | u → 0},
    ω 𝔼[e^(-α/.brule) β uk + α ck + Θ]];
NO[w_, c_, k_][ω_. 𝔼[Q_]] := Simp@Module[
    {α = ∂c Q, β = ∂w Q, Θ = Q /. c | w → 0},
    ω 𝔼[e^(α/.brule) β wk + α ck + Θ]];
NO[w_, u_, k_][ω_. 𝔼[Q_]] :=
  Simp@Module[{α = ∂w Q /. uj → 0, β = ∂u Q /. wi → 0, δ = ∂w,u Q, Θ = Q /. wi | uj → 0, ν},
    ν = (1 + (tk - 1) δ)^-1;
    ν ω 𝔼[(1 - tk) ν α β + ν β uk + ν δ uk wk + ν α wk + Θ]
   ];
```

```
m[i_, j_, k_][Z_] := Simp@Module[{a},
   (Z /. {b_(i|j) → bk, t_(i|j) → tk} // NO[wi, cj, a] // NO[ui, ca, a] // NO[wa, uj, a]) /.
    {ci → ck, wj → wk, y_a :↦ yk}]
```

```
σ[i_, j_][ℰ_] := ℰ /. {bi → bj, ti → tj, ci → cj, ui → uj, wi → wj}
```

```
Rp[i_, j_] := 𝔼[bi cj + ui wj];
Rm[i_, j_] := 𝔼[-bi cj - ti^-1 ui wj];
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```
NO[u1, c1, 1][𝔼[b2 c1 + w2 u1 + u3 w4]]
```

$$\mathbb{E}\left[b_2\, c_1 + \frac{u_1\, w_2}{t_2} + u_3\, w_4\right]$$

```
Q0 = 𝔼[Sum[βi ci, {i, 3}] + Sum[αi,j ui wj, {i, 3}, {j, 3}]]
```

$$\mathbb{E}[c_1\,\beta_1 + c_2\,\beta_2 + c_3\,\beta_3 + u_1\,w_1\,\alpha_{1,1} + u_1\,w_2\,\alpha_{1,2} + u_1\,w_3\,\alpha_{1,3} + u_2\,w_1\,\alpha_{2,1} + u_2\,w_2\,\alpha_{2,2} + u_2\,w_3\,\alpha_{2,3} + u_3\,w_1\,\alpha_{3,1} + u_3\,w_2\,\alpha_{3,2} + u_3\,w_3\,\alpha_{3,3}]$$

Q0 // m[1, 2, 1]

$$\frac{1}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}$$

$$\mathbb{E}\Big[\frac{1}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}\,\big(c_1\,\beta_1 + c_1\,\beta_2 + c_3\,\beta_3 + u_1\,w_1\,\alpha_{1,1} + e^{-\beta_2}\,u_1\,w_1\,\alpha_{1,2} + e^{-\beta_2}\,u_1\,w_3\,\alpha_{1,3} +$$
$$e^{\beta_2}\,u_1\,w_1\,\alpha_{2,1} - e^{\beta_2}\,c_1\,\beta_1\,\alpha_{2,1} + e^{\beta_2}\,c_1\,t_1\,\beta_1\,\alpha_{2,1} - e^{\beta_2}\,c_1\,\beta_2\,\alpha_{2,1} + e^{\beta_2}\,c_1\,t_1\,\beta_2\,\alpha_{2,1} - e^{\beta_2}\,c_3\,\beta_3\,\alpha_{2,1} +$$
$$e^{\beta_2}\,c_3\,t_1\,\beta_3\,\alpha_{2,1} - u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1} + t_1\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1} - u_1\,w_3\,\alpha_{1,3}\,\alpha_{2,1} + t_1\,u_1\,w_3\,\alpha_{1,3}\,\alpha_{2,1} + u_1\,w_1\,\alpha_{2,2} +$$
$$u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2} - t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2} + u_1\,w_3\,\alpha_{2,3} + u_1\,w_3\,\alpha_{1,1}\,\alpha_{2,3} - t_1\,u_1\,w_3\,\alpha_{1,1}\,\alpha_{2,3} + e^{\beta_2}\,u_3\,w_1\,\alpha_{3,1} +$$
$$e^{\beta_2}\,u_3\,w_1\,\alpha_{2,2}\,\alpha_{3,1} - e^{\beta_2}\,t_1\,u_3\,w_1\,\alpha_{2,2}\,\alpha_{3,1} + e^{\beta_2}\,u_3\,w_3\,\alpha_{2,3}\,\alpha_{3,1} - e^{\beta_2}\,t_1\,u_3\,w_3\,\alpha_{2,3}\,\alpha_{3,1} + u_3\,w_1\,\alpha_{3,2} -$$
$$e^{\beta_2}\,u_3\,w_1\,\alpha_{2,1}\,\alpha_{3,2} + e^{\beta_2}\,t_1\,u_3\,w_1\,\alpha_{2,1}\,\alpha_{3,2} + u_3\,w_3\,\alpha_{3,3} - e^{\beta_2}\,u_3\,w_3\,\alpha_{2,1}\,\alpha_{3,3} + e^{\beta_2}\,t_1\,u_3\,w_3\,\alpha_{2,1}\,\alpha_{3,3}\big)\Big]$$

Q0 // NO[w_1, u_2, 3]

$$\frac{1}{1 - \alpha_{2,1} + t_3\,\alpha_{2,1}}$$

$$\mathbb{E}\Big[\frac{1}{1 + \left(-1 + t_3\right)\,\alpha_{2,1}}\,\big(c_1\,\beta_1 + c_2\,\beta_2 + c_3\,\beta_3 + u_1\,w_3\,\alpha_{1,1} + u_1\,w_2\,\alpha_{1,2} + u_1\,w_3\,\alpha_{1,3} + u_3\,w_3\,\alpha_{2,1} - c_1\,\beta_1\,\alpha_{2,1} +$$
$$c_1\,t_3\,\beta_1\,\alpha_{2,1} - c_2\,\beta_2\,\alpha_{2,1} + c_2\,t_3\,\beta_2\,\alpha_{2,1} - c_3\,\beta_3\,\alpha_{2,1} + c_3\,t_3\,\beta_3\,\alpha_{2,1} - u_1\,w_2\,\alpha_{1,2}\,\alpha_{2,1} +$$
$$t_3\,u_1\,w_2\,\alpha_{1,2}\,\alpha_{2,1} - u_1\,w_3\,\alpha_{1,3}\,\alpha_{2,1} + t_3\,u_1\,w_3\,\alpha_{1,3}\,\alpha_{2,1} + u_3\,w_2\,\alpha_{2,2} + u_1\,w_2\,\alpha_{1,1}\,\alpha_{2,2} -$$
$$t_3\,u_1\,w_2\,\alpha_{1,1}\,\alpha_{2,2} + u_3\,w_3\,\alpha_{2,3} + u_1\,w_3\,\alpha_{1,1}\,\alpha_{2,3} - t_3\,u_1\,w_3\,\alpha_{1,1}\,\alpha_{2,3} + u_3\,w_3\,\alpha_{3,1} +$$
$$u_3\,w_2\,\alpha_{2,2}\,\alpha_{3,1} - t_3\,u_3\,w_2\,\alpha_{2,2}\,\alpha_{3,1} + u_3\,w_3\,\alpha_{2,3}\,\alpha_{3,1} - t_3\,u_3\,w_3\,\alpha_{2,3}\,\alpha_{3,1} + u_3\,w_2\,\alpha_{3,2} -$$
$$u_3\,w_2\,\alpha_{2,1}\,\alpha_{3,2} + t_3\,u_3\,w_2\,\alpha_{2,1}\,\alpha_{3,2} + u_3\,w_3\,\alpha_{3,3} - u_3\,w_3\,\alpha_{2,1}\,\alpha_{3,3} + t_3\,u_3\,w_3\,\alpha_{2,1}\,\alpha_{3,3}\big)\Big]$$

t1 = Q0 // m[1, 2, 1] // m[1, 3, 1]

$$\mathbb{E}\Big[\Big(c_1\,\beta_1 + c_1\,\beta_2 + c_1\,\beta_3 + u_1\,w_1\,\alpha_{1,1} + e^{-\beta_2}\,u_1\,w_1\,\alpha_{1,2} +$$
$$e^{-\beta_2 - \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{1,3} + e^{\beta_2}\,u_1\,w_1\,\alpha_{2,1} - e^{\beta_2}\,c_1\,\beta_1\,\alpha_{2,1} +$$
$$e^{\beta_2}\,c_1\,t_1\,\beta_1\,\alpha_{2,1} - e^{\beta_2}\,c_1\,\beta_2\,\alpha_{2,1} + e^{\beta_2}\,c_1\,t_1\,\beta_2\,\alpha_{2,1} - e^{\beta_2}\,c_1\,\beta_3\,\alpha_{2,1} + e^{\beta_2}\,c_1\,t_1\,\beta_3\,\alpha_{2,1} -$$
$$u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1} + t_1\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1} - e^{-\frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,1} +$$
$$e^{-\frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,1} + u_1\,w_1\,\alpha_{2,2} +$$
$$u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2} - t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2} + e^{-\frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{2,3} +$$
$$e^{-\frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,3} -$$
$$e^{-\frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,3} +$$
$$e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{3,1} - e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}$$
$$c_1\,\beta_1\,\alpha_{3,1} + e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,c_1\,t_1\,\beta_1\,\alpha_{3,1} -$$
$$e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,c_1\,\beta_2\,\alpha_{3,1} + e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}$$
$$c_1\,t_1\,\beta_2\,\alpha_{3,1} - e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,c_1\,\beta_3\,\alpha_{3,1} +$$
$$e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,c_1\,t_1\,\beta_3\,\alpha_{3,1} - u_1\,w_1\,\alpha_{1,3}\,\alpha_{3,1} +$$
$$t_1\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{3,1} + e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,u_1\,w_1\,\alpha_{2,2}\,\alpha_{3,1} -$$
$$e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,u_1\,w_1\,\alpha_{2,2}\,\alpha_{3,1} -$$
$$e^{\beta_2 + \frac{\beta_3}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} - \frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}} + \frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1 - e^{\beta_2}\,\alpha_{2,1} + e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,c_1\,\beta_1\,\alpha_{2,2}\,\alpha_{3,1} +$$

$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_1\,\alpha_{2,2}\,\alpha_{3,1}-$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_1\,\alpha_{2,2}\,\alpha_{3,1}-$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_2\,\alpha_{2,2}\,\alpha_{3,1}+$$
$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_2\,\alpha_{2,2}\,\alpha_{3,1}-$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_2\,\alpha_{2,2}\,\alpha_{3,1}-$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_3\,\alpha_{2,2}\,\alpha_{3,1}+$$
$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_3\,\alpha_{2,2}\,\alpha_{3,1}-$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_3\,\alpha_{2,2}\,\alpha_{3,1}-u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,2}\,\alpha_{3,1}+$$
$$2\,t_1\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,2}\,\alpha_{3,1}-t_1^2\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,2}\,\alpha_{3,1}+u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,3}\,\alpha_{3,1}-2\,t_1\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,3}\,\alpha_{3,1}+$$
$$t_1^2\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,3}\,\alpha_{3,1}+e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}u_1\,w_1\,\alpha_{3,2}-$$
$$e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_1\,\alpha_{3,2}+$$
$$e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_1\,\alpha_{3,2}-$$
$$e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_2\,\alpha_{3,2}+e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}$$
$$c_1\,t_1\,\beta_2\,\alpha_{3,2}-e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_3\,\alpha_{3,2}+$$
$$e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_3\,\alpha_{3,2}-e^{-\beta_2}\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{3,2}+$$
$$e^{-\beta_2}\,t_1\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{3,2}-e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}u_1\,w_1\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\,u_1\,w_1\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_1\,\alpha_{2,1}\,\alpha_{3,2}-$$
$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_1\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_1\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_2\,\alpha_{2,1}\,\alpha_{3,2}-$$
$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_2\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_2\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,\beta_3\,\alpha_{2,1}\,\alpha_{3,2}-$$
$$2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1\,\beta_3\,\alpha_{2,1}\,\alpha_{3,2}+$$
$$e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}c_1\,t_1^2\,\beta_3\,\alpha_{2,1}\,\alpha_{3,2}+u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,1}\,\alpha_{3,2}-$$
$$2\,t_1\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,1}\,\alpha_{3,2}+t_1^2\,u_1\,w_1\,\alpha_{1,3}\,\alpha_{2,1}\,\alpha_{3,2}-u_1\,w_1\,\alpha_{2,3}\,\alpha_{3,2}+t_1\,u_1\,w_1\,\alpha_{2,3}\,\alpha_{3,2}-$$
$$u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,3}\,\alpha_{3,2}+2\,t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,3}\,\alpha_{3,2}-t_1^2\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,3}\,\alpha_{3,2}+u_1\,w_1\,\alpha_{3,3}+u_1\,w_1\,\alpha_{1,1}\,\alpha_{3,3}-$$
$$t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{3,3}+e^{-\beta_2}\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{3,3}-e^{-\beta_2}\,t_1\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{3,3}-u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1}\,\alpha_{3,3}+$$
$$2\,t_1\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1}\,\alpha_{3,3}-t_1^2\,u_1\,w_1\,\alpha_{1,2}\,\alpha_{2,1}\,\alpha_{3,3}+u_1\,w_1\,\alpha_{2,2}\,\alpha_{3,3}-t_1\,u_1\,w_1\,\alpha_{2,2}\,\alpha_{3,3}+$$
$$u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2}\,\alpha_{3,3}-2\,t_1\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2}\,\alpha_{3,3}+t_1^2\,u_1\,w_1\,\alpha_{1,1}\,\alpha_{2,2}\,\alpha_{3,3}\Big)\Big/\Big(1-e^{\beta_2}\,\alpha_{2,1}+$$
$$e^{\beta_2}\,t_1\,\alpha_{2,1}-\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{3,1}\right)\Big/\Big(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\Big)+$$
$$\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\,\alpha_{3,1}\right)\Big/\Big(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\Big)+$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,1}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(2\,e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{2,1}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^2\alpha_{2,1}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^2\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,1}\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(3\,e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{2,1}\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(3\,e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^2\alpha_{2,1}\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^3\alpha_{2,1}\alpha_{2,2}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(e^{\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,1}\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(4\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{2,1}\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^2\alpha_{2,1}\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,1}^2\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(3\,e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{2,1}^2\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(3\,e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^2\alpha_{2,1}^2\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+$$

$$\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1^3\alpha_{2,1}^2\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)\Big)\Big]\Big/$$

$$\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}-\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}t_1\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)+\left(e^{2\beta_2+\frac{\beta_3}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}-\frac{e^{\beta_2}\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}+\frac{e^{\beta_2}t_1\beta_3\alpha_{2,1}}{1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}}}\alpha_{2,1}\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\alpha_{2,1}+e^{\beta_2}t_1\alpha_{2,1}\right)-$$

$$\left(2\,e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{2,1}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^2\,\alpha_{2,1}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^2\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,\alpha_{2,1}\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(3\,e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{2,1}\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(3\,e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^2\,\alpha_{2,1}\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^3\,\alpha_{2,1}\,\alpha_{2,2}\,\alpha_{3,1}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(e^{\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(e^{\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,\alpha_{2,1}\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(4\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{2,1}\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(2\,e^{\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^2\,\alpha_{2,1}\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,\alpha_{2,1}^2\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(3\,e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1\,\alpha_{2,1}^2\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)-$$

$$\left(3\,e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^2\,\alpha_{2,1}^2\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)+$$

$$\left(e^{2\,\beta_2+\frac{\beta_3}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}-\frac{e^{\beta_2}\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}+\frac{e^{\beta_2}\,t_1\,\beta_3\,\alpha_{2,1}}{1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}}}\,t_1^3\,\alpha_{2,1}^2\,\alpha_{3,2}\right)\Big/\left(1-e^{\beta_2}\,\alpha_{2,1}+e^{\beta_2}\,t_1\,\alpha_{2,1}\right)\Big)$$

t2 = Q0 // m[2, 3, 2] // m[1, 2, 1]

$$\frac{\mathbb{E}\left[\frac{c_1\,\beta_1+c_1\,\beta_2+\cdots 126\cdots+t_1^3\,u_1\,w_1\,\alpha_{\cdots 1}\,\alpha_{2,2}\,\alpha_{3,3}}{\cdots 34\cdots+\frac{\cdots 1\cdots}{1-\cdots 1\cdots+\cdots 1\cdots}}\right]}{1-e^{\beta_3}\,\alpha_{3,2}+\cdots 31\cdots+\frac{e^{\beta_3+\cdots 8\cdots}\,t_1^3\,\alpha_{\cdots 1\cdots}\,\alpha_{\cdots 1\cdots}^2}{1-e^{\beta_3}\,\alpha_{3,2}+e^{\beta_3}\,t_1\,\alpha_{3,2}}}$$

large output | **show less** | **show more** | **show all** | **set size limit...**

```
Simplify[t1 ≡ t2]
```

True

```
Rp[1, 2] Rm[4, 3]
```

$$\mathbb{E}\left[b_1\, c_2 - b_4\, c_3 + u_1\, w_2 - \frac{u_4\, w_3}{t_4}\right]$$

```
Rp[1, 2] Rm[4, 3] // m[1, 4, 1] // m[2, 3, 2]
```

$$\mathbb{E}[0]$$

```
Rm[1, 2] Rp[4, 3] // m[4, 1, 4] // m[2, 3, 2]
```

$$\mathbb{E}[0]$$

```
t1 = Rp[1, 2] Rp[3, 4] Rp[5, 6] // m[3, 5, a] // m[1, 6, b] // m[2, 4, c]
```

$$\mathbb{E}[b_a\, c_b + b_a\, c_c + b_b\, c_c + u_a\, w_b + u_a\, w_c + u_b\, w_c]$$

```
t2 = Rp[1, 2] Rp[3, 4] Rp[5, 6] // m[1, 3, a] // m[2, 5, b] // m[4, 6, c]
```

$$\mathbb{E}[b_a\, c_b + b_a\, c_c + b_b\, c_c + u_a\, w_b + u_a\, w_c + u_b\, w_c]$$

```
t1 ≡ t2
```

True

```
t3 = Rm[12, 1] Rm[2, 7] Rm[8, 3] Rm[4, 11] Rp[16, 5] Rp[6, 13] Rp[14, 9] Rp[10, 15]
```

$$\mathbb{E}\left[-b_{12}\, c_1 - b_8\, c_3 + b_{16}\, c_5 - b_2\, c_7 + b_{14}\, c_9 - b_4\, c_{11} + b_6\, c_{13} + b_{10}\, c_{15} - \frac{u_{12}\, w_1}{t_{12}} - \frac{u_8\, w_3}{t_8} + u_{16}\, w_5 - \frac{u_2\, w_7}{t_2} + u_{14}\, w_9 - \frac{u_4\, w_{11}}{t_4} + u_6\, w_{13} + u_{10}\, w_{15}\right]$$

```
t3 // m[1, 2, 1]
```

$$\mathbb{E}\left[-b_{12}\, c_1 - b_8\, c_3 + b_{16}\, c_5 - b_1\, c_7 + b_{14}\, c_9 - b_4\, c_{11} + b_6\, c_{13} + b_{10}\, c_{15} - \frac{u_{12}\, w_1}{t_{12}} - \frac{u_8\, w_3}{t_8} + u_{16}\, w_5 - \frac{u_1\, w_7}{t_1} - \frac{u_{12}\, w_7}{t_{12}} + \frac{u_{12}\, w_7}{t_1\, t_{12}} + u_{14}\, w_9 - \frac{u_4\, w_{11}}{t_4} + u_6\, w_{13} + u_{10}\, w_{15}\right]$$

```
t3 // m[1, 2, 1] // m[1, 3, 1]
```

$$\mathbb{E}\left[-b_8\, c_1 - b_{12}\, c_1 + b_{16}\, c_5 - b_1\, c_7 + b_{14}\, c_9 - b_4\, c_{11} + b_6\, c_{13} + b_{10}\, c_{15} - \frac{u_8\, w_1}{t_8} - \frac{u_{12}\, w_1}{t_8\, t_{12}} + u_{16}\, w_5 - \frac{t_8\, u_1\, w_7}{t_1} - \frac{u_{12}\, w_7}{t_{12}} + \frac{u_{12}\, w_7}{t_1\, t_{12}} + u_{14}\, w_9 - \frac{u_4\, w_{11}}{t_4} + u_6\, w_{13} + u_{10}\, w_{15}\right]$$

```
t4 = t3;
Do[t4 = t4 // m[1, kk, 1], {kk, 2, 16}]; Simp@t4
```

$Aborted

```
Simplify[t4 /. _𝔼 → 1]
```

$$\left(t\, t_1^4\right) \Big/ \left(t^2 - 3\, t\, \left(1 + 2\, t\right)\, t_1 + \left(1 + 16\, t + 15\, t^2\right)\, t_1^2 - 3\, \left(2 + 13\, t + 7\, t^2\right)\, t_1^3 + \left(16 + 53\, t + 16\, t^2\right)\, t_1^4 - 3\, \left(7 + 13\, t + 2\, t^2\right)\, t_1^5 + \left(15 + 16\, t + t^2\right)\, t_1^6 - 3\, \left(2 + t\right)\, t_1^7 + t_1^8\right)$$

```
Rp[1, 2] Rp[3, 4] Rp[5, 6] // m[1, 4, 4] // m[4, 5, 5] // m[5, 2, 2] // m[2, 3, 3] //
  m[3, 6, 6] // m[6, 1, 1]
```

$$\frac{1}{1-t_1+t_1^2}\,\mathbb{E}\Big[\frac{1}{1-t_1+t_1^2}\Big(3\,b_1\,c_1-3\,b_1\,c_1\,t_1+3\,b_1\,c_1\,t_1^2+\frac{u_1\,w_1}{t_1^2}+t_1\,u_1\,w_1+ t_1^{-2-\frac{1}{1-t_1+t_1^2}+\frac{t_1}{1-t_1+t_1^2}-\frac{t_1^2}{1-t_1+t_1^2}}\,u_1\,w_1-t_1^{-1-\frac{1}{1-t_1+t_1^2}+\frac{t_1}{1-t_1+t_1^2}-\frac{t_1^2}{1-t_1+t_1^2}}\,u_1\,w_1+t_1^{-\frac{1}{1-t_1+t_1^2}+\frac{t_1}{1-t_1+t_1^2}-\frac{t_1^2}{1-t_1+t_1^2}}\,u_1\,w_1\Big)\Big]$$

```
Rp[1, 2] Rp[3, 4] Rp[5, 6] // m[1, 4, 4] // m[4, 5, 5] // m[5, 2, 2] // m[2, 3, 3]
```

$$\frac{1}{1-t_3+t_3^2}\,\mathbb{E}\Big[\frac{1}{1-t_3+t_3^2}\Big(2\,b_3\,c_3+b_3\,c_6-2\,b_3\,c_3\,t_3-b_3\,c_6\,t_3+2\,b_3\,c_3\,t_3^2+b_3\,c_6\,t_3^2+\frac{u_3\,w_3}{t_3^2}+t_3\,u_3\,w_3+u_3\,w_6+\frac{u_3\,w_6}{t_3^2}-\frac{u_3\,w_6}{t_3}\Big)\Big]$$

```
Rp[1, 2] Rp[3, 4] Rp[5, 6] // m[1, 4, 4] // m[4, 5, 5] // m[5, 2, 2] // m[2, 3, 3] // m[3, 6, 6]
```

$$\frac{1}{1-t_6+t_6^2}\,\mathbb{E}\Big[\frac{1}{1-t_6+t_6^2}\Big(3\,b_6\,c_6-3\,b_6\,c_6\,t_6+3\,b_6\,c_6\,t_6^2+\frac{u_6\,w_6}{t_6^2}+t_6\,u_6\,w_6+ t_6^{-2-\frac{1}{1-t_6+t_6^2}+\frac{t_6}{1-t_6+t_6^2}-\frac{t_6^2}{1-t_6+t_6^2}}\,u_6\,w_6-t_6^{-1-\frac{1}{1-t_6+t_6^2}+\frac{t_6}{1-t_6+t_6^2}-\frac{t_6^2}{1-t_6+t_6^2}}\,u_6\,w_6+t_6^{-\frac{1}{1-t_6+t_6^2}+\frac{t_6}{1-t_6+t_6^2}-\frac{t_6^2}{1-t_6+t_6^2}}\,u_6\,w_6\Big)\Big]$$