Pensieve header: Reordering exponentials in sl_2 and in ${\mathfrak g}_0$.

Prolog

```
Go;
```

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\PPSA"];
SetOptions[EvaluationNotebook[],
  NotebookEventActions → {
    {"MenuCommand", "Save"} :> Get["MakeSnips.m"],
    PassEventsDown → True
   }];
```

sl2matrices

```
y = {{0, 0}, {1, 0}}; a = {{1, 0}, {0, -1}}; x = {{0, 1}, {0, 0}};
{a.x - x.a == 2 x, a.y - y.a == -2 y, x.y - y.x == a}
```

sl2matrices

```
{True, True, True}
```

Reordering_sl2

```
𝔼[M_?MatrixQ] := MatrixExp[M];
Simplify[𝔼[η1 y].𝔼[α1 a].𝔼[ξ1 x].𝔼[η2 y].𝔼[α2 a].𝔼[ξ2 x] == 𝔼[η0 y].𝔼[α0 a].𝔼[ξ0 x] /.
  {η0 → η1 + e^(-2 α1) η2/(1 + η2 ξ1), α0 → α1 + α2 + Log[1 + η2 ξ1], ξ0 → (ξ2 + ξ1 (e^(-2 α2) + η2 ξ2))/(1 + η2 ξ1)}]
```

Reordering_sl2

```
True
```

g0matrices

```
y = {{0, 1, 0}, {0, 0, 0}, {0, 0, 0}}; a = {{0, 0, 0}, {0, 2, 0}, {0, 0, 0}};
x = {{0, 0, 0}, {0, 0, 1}, {0, 0, 0}}; c = {{0, 0, -1}, {0, 0, 0}, {0, 0, 0}};
{a.x - x.a == 2 x, a.y - y.a == -2 y, x.y - y.x == c, x.c == c.x, y.c == c.y, a.c == c.a}
```

g0matrices

```
{True, True, True, True, True, True}
```

Reordering_g0

```
Simplify[
 𝔼[η1 y].𝔼[α1 a].𝔼[ξ1 x].𝔼[η2 y].𝔼[α2 a].𝔼[ξ2 x] == 𝔼[η0 y].𝔼[α0 a].𝔼[ξ0 x].𝔼[γ0 c] /.
  {η0 → η1 + e^(-2 α1) η2, α0 → α1 + α2, ξ0 → e^(-2 α2) ξ1 + ξ2, γ0 → η2 ξ1}]
```

Reordering_g0

```
True
```

```
Making {Snips/ReorderingDemo.txt} ...
```