Pensieve Header: Alexander blobs: Debugging the Pentagon.

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\2011-08\\w-Computations"];
<< "AlexanderBlobs-Program.m"

r[i_, j_] := Diag[1, ar[i, j]];
R[i_, j_] := DExp[r[i, j]];

v[0] = 0;

d = 1;
ModDegree[d + 1,
 Print[
                1
   v[d] = v[d - 1] - ─ Diag[1, ar[1, 2]]
                2
 ];
 V[d] = DExp[v[d]];
 V[d] ** DExp[r[1, 3] + r[2, 3]] - R[1, 3] ** R[2, 3] ** V[d]
]
```

$$-\frac{1}{2} \, \text{Diag}[1, \text{ar}[1, 2]]$$

0

```
d = 2;
ModDegree[d + 1,
 Print[
   v[d] = v[d - 1] + (1 / 24) Diag[h[1], ar[1, 2]] + (1 / 12) Diag[h[2], ar[1, 2]]
 ];
 V[d] = DExp[v[d]];
 V[d] ** DExp[r[1, 3] + r[2, 3]] - R[1, 3] ** R[2, 3] ** V[d]
]
```

$$-\frac{1}{2} \, \text{Diag}[1, \text{ar}[1, 2]] + \frac{1}{24} \, \text{Diag}[h[1], \text{ar}[1, 2]] + \frac{1}{12} \, \text{Diag}[h[2], \text{ar}[1, 2]]$$

0

```
d = 3;
ModDegree[d + 1,
 Print[
   v[d] = v[d - 1]
 ];
 V[d] = DExp[v[d]];
 V[d] ** DExp[r[1, 3] + r[2, 3]] - R[1, 3] ** R[2, 3] ** V[d]
]
```

$$-\frac{1}{2} \, \text{Diag}[1, \text{ar}[1, 2]] + \frac{1}{24} \, \text{Diag}[h[1], \text{ar}[1, 2]] + \frac{1}{12} \, \text{Diag}[h[2], \text{ar}[1, 2]]$$

0

```
Clear[Phi];
Phi[d_] := ModDegree[d + 1,
  V[d] = DExp[v[d]];
  Phi[d] = PutOn[{{1, 2}, 3}, Adjoint[V[d]]] **
    Adjoint[V[d]] ** PutOn[{2, 3}, V[d]] ** PutOn[{1, {2, 3}}, V[d]]
 ]

Pentagon[d_] := ModDegree[d + 1,
  Phi[d] ** PutOn[{1, {2, 3}, 4}, Phi[d]] ** PutOn[{2, 3, 4}, Phi[d]] -
    PutOn[{{1, 2}, 3, 4}, Phi[d]] ** PutOn[{1, 2, {3, 4}}, Phi[d]]
 ]

Phi[2]
```

$$\text{Diag}[1] + \frac{1}{12}\,\text{Diag}[h[1], ar[2, 3]] - \frac{1}{12}\,\text{Diag}[h[2], ar[1, 3]] + \frac{1}{12}\,\text{Diag}[h[3], ar[1, 2]]$$

```
Pentagon[2]
```

0

```
Phi[3]
```

$$\text{Diag}[1] + \frac{1}{12}\,\text{Diag}[h[1], ar[2, 3]] - \frac{1}{12}\,\text{Diag}[h[2], ar[1, 3]] + \frac{1}{12}\,\text{Diag}[h[3], ar[1, 2]]$$

```
Pentagon[3]
```

0

```
Phi[2]
```

$$\text{Diag}[1] + \frac{1}{12}\,\text{Diag}[h[1], ar[2, 3]] - \frac{1}{12}\,\text{Diag}[h[2], ar[1, 3]] + \frac{1}{12}\,\text{Diag}[h[3], ar[1, 2]]$$

```
b[Phi[2], PutOn[{{1, 2, 3}, 4}, Diag[1, ar[1, 2]]]]
```

0

```
ModDegree[3, {
  PutOn[{{1, 2, 3}, 4}, R[1, 2]] ** PutOn[{{1, 2}, 3}, V[2]] - PutOn[{{1, 2}, 3}, V[2]] **
  }]
```