

Pensieve header: Implementing the Jones polynomial.

Based on <http://drorbn.net/syd3>

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In[ ]:= 1 + 1

In[ ]:= Integrate[1 / (1 + x^2), x]

In[ ]:= K = PD[X[1, 5, 2, 4], X[5, 3, 6, 2], X[3, 1, 4, 6]]

In[ ]:= prod = 1;
Do[prod = prod * k, {k, 1, 7}];
prod

In[ ]:= {10, 9, 180, 26} /. 9 -> 23

In[ ]:= {10, 9, 180, 26} /. x_ -> x^2

In[ ]:= {10, 9, 180, 26, Tembel} /. x_ -> x^2

In[ ]:= t1 = K /. X[i_, j_, k_, l_] -> A * p[i, j] * p[k, l] + B * p[i, l] p[j, k]

In[ ]:= t1

In[ ]:= Expand[(a + b) (a - b)]

In[ ]:= Factor[a^2 - b^2]

In[ ]:= Expand[t1]

In[ ]:= Factor[a^2 - b^2] // FullForm

In[ ]:= t2 = Expand[t1 /. PD -> Times]

In[ ]:= {7, 1} /. {{0, n_} -> n, {k_, n_} -> {k - 1, n * k}}

In[ ]:= {7, 1} //. {{0, n_} -> n, {k_, n_} -> {k - 1, n * k}}

In[ ]:= t3 = t2 //. {p[i_, j_] p[j_, k_] -> p[i, k]}

In[ ]:= t4 = t3 /. {p[i_, i_] -> d, p[i_, j_]^2 -> d}

In[ ]:= t5 = Expand[t4 /. {B -> 1 / A, d -> -A^2 - 1 / A^2}]

In[ ]:= Knots

In[ ]:= Knot[3, 1] /. Knots

In[ ]:= Knot[10, 165] /. Knots

In[ ]:= K = Knot[10, 73] /. Knots;
t1 = K /. X[i_, j_, k_, l_] -> A * p[i, j] * p[k, l] + B * p[i, l] p[j, k];
t2 = Expand[t1 /. PD -> Times];
t3 = t2 //. {p[i_, j_] p[j_, k_] -> p[i, k], p[i_, j_] p[k_, j_] -> p[i, k]};
t4 = t3 /. {p[i_, i_] -> d, p[i_, j_]^2 -> d};
Expand[t4 /. {B -> 1 / A, d -> -A^2 - 1 / A^2}]

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In[ ]:= K = GST48 /. Knots
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In[ ]:= Length[K]
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In[ ]:= K = GST48 /. Knots;
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t1 = K /. X[i_, j_, k_, l_] -> A * p[i, j] * p[k, l] + B * p[i, l] p[j, k];
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```
t2 = Expand[t1 /. PD -> Times];
```

```
t3 = t2 //. {p[i_, j_] p[j_, k_] -> p[i, k],
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  p[i_, j_] p[k_, j_] -> p[i, k], p[j_, i_] p[j_, k_] -> p[i, k]};
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```
t4 = t3 /. {p[i_, i_] -> d, p[i_, j_] ^2 -> d};
```

```
Expand[t4 /. {B -> 1/A, d -> -A^2 - 1/A^2}]
```

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In[ ]:= K = Knot[8, 17] /. Knots;
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SetAttributes[p, Orderless];
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t1 = K /. X[i_, j_, k_, l_] -> A * p[i, j] * p[k, l] + B * p[i, l] p[j, k];
```

```
t2 = Expand[t1 /. PD -> Times];
```

```
t3 = t2 //. {p[i_, j_] p[j_, k_] -> p[i, k]};
```

```
t4 = t3 /. {p[i_, i_] -> d, p[i_, j_] ^2 -> d};
```

```
Expand[t4 /. {B -> 1/A, d -> -A^2 - 1/A^2}]
```