

Pensieve header: Testing Profile.m using 1-smidgen computations.

Initialization

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\Profile"];
Once[<< KnotTheory`];
Once[<< Profile.m]
```

Loading KnotTheory` version of September 6, 2014, 13:37:37.2841.

Read more at <http://katlas.org/wiki/KnotTheory>.

This is Profile.m, Nov 2016 mods of July 1994 version

? BeginProfile

Info43689258082-8677057

BeginProfile[] begins a profiling session, with root name ProfileRoot. BeginProfile[root] does same with root name root.

? ProfileData

Info53689258082-8677057

The result of EndProfile. Has format ProfileData[root,calls,total,self], where root is the profile rootlabel, calls is a linear combination of tags with head Called, andtotal and self are linear combinations of tags with head TimeUnder.

Rotational Virtual Knots

```
RVK::usage =
  "RVK[xs, rots] represents a Rotational Virtual Knot with a list of n Xp/Xm crossings xs and
  a length 2n list of rotation numbers rots. Crossing sites are indexed 1 through
  2n, and rots[[k]] is the rotation between site k-1 and site k. RVK is also a casting
  operator converting to the RVK presentation from other knot presentations.";
RVK[pd_PD] := Module[{n, xs, x, rots, front, k},
  n = Length[pd];
  xs = List@@pd /. x_X => If[PositiveQ[x], Xp[x[[4]], x[[1]], Xm[x[[2]], x[[1]]];
  rots = Table[0, {2 n}];
  front = {0};
  For[k = 0, k < 2 n, ++k,
  If[k == 0 || FreeQ[front, -k],
  front = Flatten[front /. k -> Catch[xs /. {
    Xp[k + 1, L_] | Xm[L_, k + 1] => Throw[{L, k + 1, 1 - L}],
    Xp[L_, k + 1] | Xm[k + 1, L_] => (++rots[[L]]; Throw[{1 - L, k + 1, L}])
  }]],
  If[MatchQ[front, {___, k, ___, -k, ___}], --rots[[k + 1]]
  ]
  ];
  RVK[xs, rots]
  ];
RVK[K_] := RVK[PD[K]];
```

NOE-1t

Logos

$$\Delta[k_] := (1 - t_k) (\alpha^2 \beta^2 + 4 \alpha \beta \delta \mu + 2 \delta^2 \mu^2) / 2 + 2 \mu^2 (\alpha \beta + \delta \mu) c_k - \beta (2 \mu - 1) (\alpha \beta + 2 \delta \mu) u_k + 2 \beta \delta \mu^2 c_k u_k - \beta^2 \delta (3 \mu - 1) * u_k^2 / 2 + \alpha (\alpha \beta + 2 \delta \mu) w_k + 2 \alpha \delta \mu^2 c_k w_k - 2 (t_k - 1) \delta^2 (\alpha \beta + \delta \mu) u_k w_k + 2 \delta^2 \mu^2 c_k u_k w_k - \beta \delta^2 (2 \mu - 1) * u_k^2 w_k + \alpha^2 \delta (1 + \mu) w_k^2 / 2 + \alpha \delta^2 u_k * w_k^2 - (t_k - 1) \delta^4 * u_k^2 * w_k^2 / 2;$$

```

DPx→Dα,y→Dβ[P-][f-] := PPDP[ (* means P[∂α,∂β][f] *)
  Total[CoefficientRules[P, {x, y}] /. ({m-, n-} → c-) ⇒ c D[f, {α, m}, {β, n}]]
]

```

```

CF[ $\mathbb{E}[\omega-, L-, Q-, P-]] := PPCF[
  Expand /@ PPTogether[
    Together /@
       $\mathbb{E}[\omega /. b_{L-} \Rightarrow \text{Log}[t_L], L, Q /. b_{L-} \Rightarrow \text{Log}[t_L], P /. b_{L-} \Rightarrow \text{Log}[t_L]]$ 
    ]
  ];
 $\mathbb{E} /: \mathbb{E}[\omega 1-, L 1-, Q 1-, P 1-] \mathbb{E}[\omega 2-, L 2-, Q 2-, P 2-] := CF @ \mathbb{E}[\omega 1 \omega 2, L 1 + L 2, \omega 2 Q 1 + \omega 1 Q 2, \omega^2 P 1 + \omega^1 P 2];$$ 
```

```

Nui cj→k-[ $\mathbb{E}[\omega-, L-, Q-, P-]] := PPNuc@With[{q = e-γ β uk + γ ck}, CF[
   $\mathbb{E}[\omega, \gamma c_k + (L /. c_j \rightarrow \theta), \omega e^{-\gamma} \beta u_k + (Q /. u_i \rightarrow \theta), e^{-q} \text{DP}_{c_j \rightarrow D_\gamma, u_i \rightarrow D_\beta}[P][e^q]] /. \{\gamma \rightarrow \partial_{c_j} L, \beta \rightarrow \omega^{-1} \partial_{u_i} Q\}]]$ ;
Nwi cj→k-[ $\mathbb{E}[\omega-, L-, Q-, P-]] := PPNwc@With[{q = eγ α wk + γ ck}, CF[
   $\mathbb{E}[\omega, \gamma c_k + (L /. c_j \rightarrow \theta), \omega e^\gamma \alpha w_k + (Q /. w_i \rightarrow \theta), e^{-q} \text{DP}_{c_j \rightarrow D_\gamma, w_i \rightarrow D_\alpha}[P][e^q]] /. \{\gamma \rightarrow \partial_{c_j} L, \alpha \rightarrow \omega^{-1} \partial_{w_i} Q\}]]$ ;$$ 
```

```

Nwi uj→k-[ $\mathbb{E}[\omega-, L-, Q-, P-]] := PPNwu@With[{q = (1 - tk) μ-1 α β + μ-1 β uk + μ-1 δ uk wk + μ-1 α wk}, CF[
   $\mathbb{E}[\mu \omega, L, \mu \omega q + \mu (Q /. w_i | u_j \rightarrow \theta), \mu^4 (\text{DP}_{w_i \rightarrow D_\alpha, u_j \rightarrow D_\beta}[P][e^q] /. e \rightarrow 1) + \omega^4 \Delta[k]] /. \mu \rightarrow 1 + (t_k - 1) \delta /. \{\alpha \rightarrow \omega^{-1} (\partial_{w_i} Q /. u_j \rightarrow \theta), \beta \rightarrow \omega^{-1} (\partial_{u_j} Q /. w_i \rightarrow \theta), \delta \rightarrow \omega^{-1} \partial_{w_i, u_j} Q\}]]$ ;$ 
```

```

mi-,j-→k-[Z-] := PPm@Module[{x, y, z},
  Z // Nwi cj→x // Nwx uj→y // ReplaceAll[{cx|y → cx, wj → wy}] // Nui cx→x // ReplaceAll[z-i|j|x|y → zk] // CF];

```

```

Ri-,j-+ :=  $\mathbb{E}[1, b_i c_j, u_i w_j, -c_i (t_i - 1)^2 / 2 - c_i^2 (t_i - 1)^2 / 2 + c_i c_j (t_j^2 - t_i - 2) / 2 - c_j u_i w_i / 2 + c_i (1 - t_i) u_i w_i - u_i^2 w_j^2 / 2 + u_i w_j + c_j t_i u_i w_j / 2 + c_i (t_i - 2) t_i u_i w_j + c_i (1 + t_j) u_j w_j / 2 + (t_i - 1) u_i^2 w_i w_j - (t_i - 2) t_i u_i^2 w_j^2 / 2]$ ;
Ri-,j-- :=  $\mathbb{E}[1, -b_i c_j, -t_i^{-1} u_i w_j, c_i (t_i - 1)^2 / 2 + c_i^2 (t_i - 1)^2 / 2 + c_i c_j (2 + t_i - t_j^2) / 2 + c_j u_i w_i / 2 + c_i (t_i - 1) u_i w_i + u_i^2 w_j^2 / 2 + (1 - t_i^{-1}) u_i w_j / 2 + c_i (2 t_i - 5 + 3 t_i^{-1}) u_i w_j / 2 + c_j (t_i^{-1} + 1 - t_i^{-1} t_j^2) u_i w_j / 2 - c_i (t_j + 1) u_j w_j / 2 + (2 - 3 t_i^{-1}) u_i^2 w_i w_j / 2 + (1 + 2 t_i^{-2} - 3 t_i^{-1}) u_i^2 w_j^2 / 2 - t_i^{-1} (1 + t_j) u_i u_j w_j^2 / 2]$ ;
uri- :=  $\mathbb{E}[t_i^{-1/4}, \theta, \theta, c_i t_i / 4 + u_i w_i / 8]$ ;
nri- :=  $\mathbb{E}[t_i^{1/4}, \theta, \theta, -c_i t_i^3 / 4 - t_i^2 u_i w_i / 8]$ ;
uli- :=  $\mathbb{E}[t_i^{1/4}, \theta, \theta, c_i t_i (4 + t_i) / 4 - t_i^2 u_i w_i / 8]$ ;
nli- :=  $\mathbb{E}[t_i^{-1/4}, \theta, \theta, -c_i (1 + 4 t_i^{-1}) / 4 + u_i w_i / 8]$ ;

```

```

rot[-, 0] =  $\mathbb{E}[1, \theta, \theta, \theta]$ ;
rot[i-, 1] := Module[{y}, nli ury // mi,y→i];
rot[i-, n_Integer] /; n > 1 := Module[{y}, rot[i, n - 1] rot[y, 1] // mi,y→i];
rot[i-, -1] := Module[{y}, nri uly // mi,y→i];
rot[i-, n_Integer] /; n < -1 := Module[{y}, rot[i, n + 1] rot[y, -1] // mi,y→i];

```

Z

```

t_ = t;
Z[K_] := Z[RVK@K];
Z[rvk_RVK] := PPz@Module[{todo, n, rots,  $\xi$ , done, st, x,  $\xi_1$ , i, j, k, k1, k2, k3},
  {todo, rots} = List@@rvk;
  AppendTo[rots, 0];
  n = Length[todo];
   $\xi$  =  $\mathbb{E}[1, 0, 0, 0]$ ;
  done = {0};
  st = Range[0, 2 n + 1];
  While[todo != {},
    {x} = MaximalBy[todo, Length[done  $\cap$  {#[[1]], #[[2]], #[[1]] - 1, #[[2]] - 1}] &, 1];
    Z$tudo = todo; Z$x = x;
    {i, j} = List@@x;
     $\xi_1$  = Switch[Head[x],
      Xp, mj,k→j [ $R_{i,j}^+$  ( $R_{k3,k}^-$  nrk1 ulk2 // mk,k1→k // mk,k2→k // mk,k3→k) ],
      Xm, mj,k→j [ $R_{i,j}^-$  ( $R_{k,k3}^+$  nrk1 ulk2 // mk,k1→k // mk,k2→k // mk,k3→k) ]
    ];
     $\xi_1$  = rot[k, rots[[i]]  $\xi_1$  // mk,i→i; rots[[i]] = 0;
     $\xi_1$  =  $\xi_1$  rot[k, rots[[i + 1]] // mi,k→i; rots[[i + 1]] = 0;
     $\xi_1$  = rot[k, rots[[j]]  $\xi_1$  // mk,j→j; rots[[j]] = 0;
     $\xi_1$  =  $\xi_1$  rot[k, rots[[j + 1]] // mj,k→j; rots[[j + 1]] = 0;
     $\xi$  *=  $\xi_1$ ;
    If[MemberQ[done, i],  $\xi$  =  $\xi$  // mi,i+1→i; st = st /. st[[i + 2]] → st[[i + 1]];
    If[MemberQ[done, i - 1],  $\xi$  =  $\xi$  // mst[[i],i→st[[i]]; st = st /. st[[i + 1]] → st[[i]];
    If[MemberQ[done, j],  $\xi$  =  $\xi$  // mj,j+1→j; st = st /. st[[j + 2]] → st[[j + 1]];
    If[MemberQ[done, j - 1],  $\xi$  =  $\xi$  // mst[[j],j→st[[j]]; st = st /. st[[j + 1]] → st[[j]];
    done = done  $\cup$  {i - 1, i, j - 1, j};
    todo = DeleteCases[todo, x]
  ];
   $\xi$  /. {u0 → u, c0 → c, w0 → w}
]

```

Testing ...

Timing[Z[Knot[10, 100]]]

KnotTheory: Loading precomputed data in PD4Knots`



$$\left\{ 16.4531, \mathbb{E} \left[13 + \frac{1}{t^4} - \frac{4}{t^3} + \frac{9}{t^2} - \frac{12}{t} - 12t + 9t^2 - 4t^3 + t^4, 0, 0, \right. \right.$$

$$2563146 + 667500c + \frac{6}{t^{16}} - \frac{8c}{t^{16}} - \frac{92}{t^{15}} + \frac{118c}{t^{15}} + \frac{723}{t^{14}} - \frac{892c}{t^{14}} - \frac{3818}{t^{13}} + \frac{4523c}{t^{13}} + \frac{15133}{t^{12}} - \frac{17161c}{t^{12}} - \frac{47848}{t^{11}} +$$

$$\frac{51709c}{t^{11}} + \frac{125539}{t^{10}} - \frac{128505c}{t^{10}} - \frac{281054}{t^9} + \frac{270279c}{t^9} + \frac{548129}{t^8} - \frac{489715c}{t^8} - \frac{945756}{t^7} + \frac{772841c}{t^7} + \frac{1460263}{t^6} -$$

$$\frac{1066829c}{t^6} - \frac{2034106}{t^5} + \frac{1282861c}{t^5} + \frac{2570432}{t^4} - \frac{1320331c}{t^4} - \frac{2956518}{t^3} + \frac{1107336c}{t^3} + \frac{3099338}{t^2} - \frac{640054c}{t^2} -$$

$$\frac{2958726}{t} - \frac{540c}{t} - 2000454t - 1197840ct + 1387610t^2 + 1472160ct^2 - 832998t^3 - 1456020ct^3 + 407256t^4 +$$

$$1204364ct^4 - 132546t^5 - 829886ct^5 - 9557t^6 + 453636ct^6 + 59220t^7 - 162131ct^7 - 58859t^8 - 11711ct^8 +$$

$$40498t^9 + 81439ct^9 - 22001t^{10} - 84595ct^{10} + 9704t^{11} + 59721ct^{11} - 3455t^{12} - 32685ct^{12} + 966t^{13} +$$

$$14251ct^{13} - 201t^{14} - 4919ct^{14} + 28t^{15} + 1307ct^{15} - 2t^{16} - 253ct^{16} + 32ct^{17} - 2ct^{18} - 493132uw + \frac{8uw}{t^{16}} -$$

$$\frac{110uw}{t^{15}} + \frac{782uw}{t^{14}} - \frac{3741uw}{t^{13}} + \frac{13420uw}{t^{12}} - \frac{38289uw}{t^{11}} + \frac{90216uw}{t^{10}} - \frac{180063uw}{t^9} + \frac{309652uw}{t^8} - \frac{463189uw}{t^7} +$$

$$\frac{603640uw}{t^6} - \frac{679221uw}{t^5} + \frac{641110uw}{t^4} - \frac{466226uw}{t^3} + \frac{173828uw}{t^2} + \frac{174368uw}{t} + 704708t uw - 767452t^2 uw +$$

$$688568t^3 uw - 515796t^4 uw + 314090t^5 uw - 139546t^6 uw + 22585t^7 uw + 34296t^8 uw - 47143t^9 uw +$$

$$37452t^{10} uw - 22269t^{11} uw + 10416t^{12} uw - 3835t^{13} uw + 1084t^{14} uw - 223t^{15} uw + 30t^{16} uw - 2t^{17} uw \left. \right\}$$

BeginProfile[];

Timing[Z[Knot[10, 100]]]

EndProfile[];

$$\left\{ 16.3906, \mathbb{E} \left[13 + \frac{1}{t^4} - \frac{4}{t^3} + \frac{9}{t^2} - \frac{12}{t} - 12t + 9t^2 - 4t^3 + t^4, 0, 0, \right. \right.$$

$$2563146 + 667500c + \frac{6}{t^{16}} - \frac{8c}{t^{16}} - \frac{92}{t^{15}} + \frac{118c}{t^{15}} + \frac{723}{t^{14}} - \frac{892c}{t^{14}} - \frac{3818}{t^{13}} + \frac{4523c}{t^{13}} + \frac{15133}{t^{12}} - \frac{17161c}{t^{12}} - \frac{47848}{t^{11}} +$$

$$\frac{51709c}{t^{11}} + \frac{125539}{t^{10}} - \frac{128505c}{t^{10}} - \frac{281054}{t^9} + \frac{270279c}{t^9} + \frac{548129}{t^8} - \frac{489715c}{t^8} - \frac{945756}{t^7} + \frac{772841c}{t^7} + \frac{1460263}{t^6} -$$

$$\frac{1066829c}{t^6} - \frac{2034106}{t^5} + \frac{1282861c}{t^5} + \frac{2570432}{t^4} - \frac{1320331c}{t^4} - \frac{2956518}{t^3} + \frac{1107336c}{t^3} + \frac{3099338}{t^2} - \frac{640054c}{t^2} -$$

$$\frac{2958726}{t} - \frac{540c}{t} - 2000454t - 1197840ct + 1387610t^2 + 1472160ct^2 - 832998t^3 - 1456020ct^3 + 407256t^4 +$$

$$1204364ct^4 - 132546t^5 - 829886ct^5 - 9557t^6 + 453636ct^6 + 59220t^7 - 162131ct^7 - 58859t^8 - 11711ct^8 +$$

$$40498t^9 + 81439ct^9 - 22001t^{10} - 84595ct^{10} + 9704t^{11} + 59721ct^{11} - 3455t^{12} - 32685ct^{12} + 966t^{13} +$$

$$14251ct^{13} - 201t^{14} - 4919ct^{14} + 28t^{15} + 1307ct^{15} - 2t^{16} - 253ct^{16} + 32ct^{17} - 2ct^{18} - 493132uw + \frac{8uw}{t^{16}} -$$

$$\frac{110uw}{t^{15}} + \frac{782uw}{t^{14}} - \frac{3741uw}{t^{13}} + \frac{13420uw}{t^{12}} - \frac{38289uw}{t^{11}} + \frac{90216uw}{t^{10}} - \frac{180063uw}{t^9} + \frac{309652uw}{t^8} - \frac{463189uw}{t^7} +$$

$$\frac{603640uw}{t^6} - \frac{679221uw}{t^5} + \frac{641110uw}{t^4} - \frac{466226uw}{t^3} + \frac{173828uw}{t^2} + \frac{174368uw}{t} + 704708t uw - 767452t^2 uw +$$

$$688568t^3 uw - 515796t^4 uw + 314090t^5 uw - 139546t^6 uw + 22585t^7 uw + 34296t^8 uw - 47143t^9 uw +$$

$$37452t^{10} uw - 22269t^{11} uw + 10416t^{12} uw - 3835t^{13} uw + 1084t^{14} uw - 223t^{15} uw + 30t^{16} uw - 2t^{17} uw \left. \right\}$$

PrintProfile[];

Together: called 490 times, time in 13.842/13.842

Parents:

(490) 13.840/ 13.840 under CF

DP: called 306 times, time in 1.061/1.061

Parents:

(102) 0.405/ 0.405 under Nuc

(102) 0.331/ 0.331 under Nwc

(102) 0.325/ 0.325 under Nwu

CF: called 490 times, time in 0.63/14.472

Parents:

(102) 0.174/ 1.234 under m

(102) 0.109/ 2.877 under Nuc

(102) 0.143/ 2.329 under Nwc

(102) 0.157/ 7.426 under Nwu

(82) 0.047/ 0.606 under z

Children:

(490) 13.840/ 13.840 above Together

m: called 102 times, time in 0.299/15.738

Parents:

(102) 0.299/ 15.740 under z

Children:

(102) 0.174/ 1.234 above CF

(102) 0.123/ 3.405 above Nuc

(102) 0.154/ 2.814 above Nwc

(102) 0.235/ 7.986 above Nwu

Nwu: called 102 times, time in 0.235/7.986

Parents:

(102) 0.235/ 7.986 under m

Children:

(102) 0.157/ 7.426 above CF

(102) 0.325/ 0.325 above DP

Nwc: called 102 times, time in 0.154/2.814

Parents:

(102) 0.154/ 2.814 under m

Children:

(102) 0.143/ 2.329 above CF

(102) 0.331/ 0.331 above DP

Nuc: called 102 times, time in 0.123/3.405

Parents:

(102) 0.123/ 3.405 under m

Children:

(102) 0.109/ 2.877 above CF

(102) 0.405/ 0.405 above DP

z: called 1 times, time in 0.047/16.391

Parents:

(1) 0.047/ 16.390 under ProfileRoot

Children:

(82) 0.047/ 0.606 above CF

(102) 0.299/ 15.740 above m

ProfileRoot: called 0 times, time in 0./0.

Children:

(1) 0.047/ 16.390 above z

BeginProfile[];

Timing[Z[TorusKnot[9, 5]]]

EndProfile[];

$$\{1130.7, \mathbb{E}\left[-1 + \frac{1}{t^{16}} - \frac{1}{t^{15}} + \frac{1}{t^{11}} - \frac{1}{t^{10}} + \frac{1}{t^7} - \frac{1}{t^5} + \frac{1}{t^2} + t^2 - t^5 + t^7 - t^{10} + t^{11} - t^{15} + t^{16}, 0, 0, \right.$$

$$-7580 - \frac{211c}{2} - \frac{32c}{t^{64}} + \frac{1}{t^{63}} + \frac{118c}{t^{63}} - \frac{3}{t^{62}} - \frac{293c}{2t^{62}} + \frac{3}{t^{61}} + \frac{44c}{t^{61}} - \frac{1}{t^{60}} + \frac{47c}{t^{60}} - \frac{1}{t^{59}} - \frac{156c}{t^{59}} + \frac{8}{t^{58}} + \frac{442c}{t^{58}} - \frac{18}{t^{57}} - \frac{1077c}{2t^{57}} +$$

$$\frac{16}{t^{56}} + \frac{161c}{t^{56}} - \frac{6}{t^{55}} + \frac{63c}{t^{55}} + \frac{3}{t^{54}} - \frac{5c}{t^{54}} + \frac{12}{t^{53}} + \frac{1039c}{2t^{53}} - \frac{44}{t^{52}} - \frac{2157c}{2t^{52}} + \frac{45}{t^{51}} + \frac{526c}{t^{51}} - \frac{25}{t^{50}} - \frac{269c}{2t^{50}} + \frac{41}{t^{49}} + \frac{686c}{t^{49}} - \frac{28}{t^{48}} +$$

$$\frac{48c}{t^{48}} - \frac{62}{t^{47}} - \frac{3363c}{2t^{47}} + \frac{89}{t^{46}} + \frac{1009c}{t^{46}} - \frac{45}{t^{45}} + \frac{379c}{2t^{45}} + \frac{105}{t^{44}} + \frac{1007c}{t^{44}} - \frac{135}{t^{43}} - \frac{820c}{t^{43}} - \frac{50}{t^{42}} - \frac{1940c}{t^{42}} + \frac{125}{t^{41}} + \frac{2475c}{2t^{41}} +$$

$$\frac{20}{t^{40}} + \frac{3045c}{2t^{40}} + \frac{90}{t^{39}} + \frac{771c}{2t^{39}} - \frac{284}{t^{38}} - \frac{1932c}{t^{38}} - \frac{3}{t^{37}} - \frac{1979c}{t^{37}} + \frac{188}{t^{36}} + \frac{4673c}{2t^{36}} + \frac{179}{t^{35}} + \frac{4759c}{2t^{35}} - \frac{86}{t^{34}} - \frac{1877c}{2t^{34}} - \frac{437}{t^{33}} -$$

$$\frac{5201c}{2t^{33}} + \frac{32}{t^{32}} - \frac{4617c}{2t^{32}} + \frac{491}{t^{31}} + \frac{9827c}{2t^{31}} + \frac{214}{t^{30}} + \frac{3801c}{2t^{30}} - \frac{402}{t^{29}} - \frac{5375c}{2t^{29}} - \frac{593}{t^{28}} - \frac{2928c}{t^{28}} + \frac{131}{t^{27}} - \frac{2767c}{2t^{27}} + \frac{1110}{t^{26}} +$$

$$\frac{6791c}{t^{26}} - \frac{75}{t^{25}} + \frac{891c}{2t^{25}} - \frac{804}{t^{24}} - \frac{7693c}{2t^{24}} - \frac{858}{t^{23}} - \frac{7019c}{2t^{23}} + \frac{738}{t^{22}} + \frac{1421c}{t^{22}} + \frac{1669}{t^{21}} + \frac{6804c}{t^{21}} - \frac{695}{t^{20}} - \frac{3051c}{2t^{20}} - \frac{1341}{t^{19}} -$$

$$\frac{4382c}{t^{19}} - \frac{989}{t^{18}} - \frac{2704c}{t^{18}} + \frac{1903}{t^{17}} + \frac{3557c}{t^{17}} + \frac{1900}{t^{16}} + \frac{5333c}{t^{16}} - \frac{1613}{t^{15}} - \frac{5527c}{2t^{15}} - \frac{2246}{t^{14}} - \frac{9483c}{2t^{14}} - \frac{122}{t^{13}} - \frac{471c}{2t^{13}} + \frac{2952}{t^{12}} +$$

$$\frac{3834c}{t^{12}} + \frac{1811}{t^{11}} + \frac{2991c}{t^{11}} - \frac{3013}{t^{10}} - \frac{6079c}{2t^{10}} - \frac{2956}{t^9} - \frac{3551c}{t^9} + \frac{1656}{t^8} + \frac{2677c}{2t^8} + \frac{3603}{t^7} + \frac{2657c}{t^7} + \frac{1390}{t^6} + \frac{2131c}{2t^6} -$$

$$\frac{5340}{t^5} - \frac{4827c}{2t^5} - \frac{2004}{t^4} - \frac{1253c}{t^4} + \frac{3247}{t^3} + \frac{1098c}{t^3} + \frac{3938}{t^2} + \frac{1537c}{2t^2} + \frac{219}{t} + \frac{33c}{2t} + 281t - \frac{155ct}{2} + 4422t^2 -$$

$$\frac{999ct^2}{2} + 3913t^3 - \frac{1543ct^3}{2} - 2476t^4 + \frac{853ct^4}{2} - 7540t^5 + \frac{4969ct^5}{2} + 2314t^6 - 492ct^6 + 5381t^7 - 2559ct^7 +$$

$$2868t^8 - \frac{2851ct^8}{2} - 5260t^9 + \frac{4891ct^9}{2} - 5823t^{10} + 3689ct^{10} + 3989t^{11} - \frac{4103ct^{11}}{2} + 6048t^{12} - 4343ct^{12} -$$

$$278t^{13} - \frac{147ct^{13}}{2} - 5354t^{14} + 3921ct^{14} - 4403t^{15} + 3528ct^{15} + 5644t^{16} - \frac{7647ct^{16}}{2} + 5541t^{17} - \frac{10543ct^{17}}{2} -$$

$$\begin{aligned}
& 3707 t^{18} + \frac{5489 c t^{18}}{2} - 3735 t^{19} + 3983 c t^{19} - 3145 t^{20} + 2369 c t^{20} + 7171 t^{21} - 5488 c t^{21} + 2542 t^{22} - 3792 c t^{22} - \\
& 4262 t^{23} + \frac{8657 c t^{23}}{2} - 2676 t^{24} + 3174 c t^{24} - 1525 t^{25} + 1067 c t^{25} + 7558 t^{26} - \frac{13107 c t^{26}}{2} - 1003 t^{27} - \frac{1681 c t^{27}}{2} - \\
& 3099 t^{28} + \frac{8803 c t^{28}}{2} - 1910 t^{29} + 1851 c t^{29} + 394 t^{30} - \frac{859 c t^{30}}{2} + 5389 t^{31} - 5320 c t^{31} - 1952 t^{32} + \frac{1609 c t^{32}}{2} - \\
& 2483 t^{33} + \frac{7533 c t^{33}}{2} - 834 t^{34} + \frac{1527 c t^{34}}{2} + 1649 t^{35} - \frac{3589 c t^{35}}{2} + 2420 t^{36} - \frac{5573 c t^{36}}{2} - 1409 t^{37} + \frac{2431 c t^{37}}{2} - \\
& 2108 t^{38} + \frac{5467 c t^{38}}{2} + 558 t^{39} - \frac{727 c t^{39}}{2} + 920 t^{40} - 1473 c t^{40} + 1355 t^{41} - 1338 c t^{41} - 1310 t^{42} + \frac{2355 c t^{42}}{2} - \\
& 1425 t^{43} + \frac{3825 c t^{43}}{2} + 1535 t^{44} - \frac{2845 c t^{44}}{2} - 495 t^{45} - 230 c t^{45} + 1331 t^{46} - 772 c t^{46} - 1378 t^{47} + 893 c t^{47} - \\
& 412 t^{48} + \frac{2047 c t^{48}}{2} + 1119 t^{49} - 1311 c t^{49} - 675 t^{50} + \frac{569 c t^{50}}{2} + 963 t^{51} - 486 c t^{51} - 1188 t^{52} + 752 c t^{52} + 436 t^{53} + \\
& \frac{183 c t^{53}}{2} + 165 t^{54} - 554 c t^{54} - 226 t^{55} + \frac{571 c t^{55}}{2} + 464 t^{56} - \frac{705 c t^{56}}{2} - 702 t^{57} + 517 c t^{57} + 472 t^{58} - 181 c t^{58} - \\
& 119 t^{59} - 169 c t^{59} - 31 t^{60} + \frac{351 c t^{60}}{2} + 125 t^{61} - 144 c t^{61} - 189 t^{62} + 148 c t^{62} + 127 t^{63} - 49 c t^{63} - 32 t^{64} - \\
& 46 c t^{64} + \frac{79 c t^{65}}{2} - 8 c t^{66} - \frac{591 u w}{2} + \frac{32 u w}{t^{64}} - \frac{86 u w}{t^{63}} + \frac{121 u w}{2 t^{62}} + \frac{33 u w}{2 t^{61}} - \frac{61 u w}{2 t^{60}} + \frac{251 u w}{2 t^{59}} - \frac{633 u w}{2 t^{58}} + \frac{222 u w}{t^{57}} + \\
& \frac{61 u w}{t^{56}} - \frac{2 u w}{t^{55}} + \frac{3 u w}{t^{54}} - \frac{1033 u w}{2 t^{53}} + \frac{562 u w}{t^{52}} + \frac{36 u w}{t^{51}} + \frac{341 u w}{2 t^{50}} - \frac{1031 u w}{2 t^{49}} - \frac{1127 u w}{2 t^{48}} + \frac{1118 u w}{t^{47}} + \frac{109 u w}{t^{46}} - \frac{161 u w}{2 t^{45}} - \\
& \frac{2175 u w}{2 t^{44}} - \frac{535 u w}{2 t^{43}} + \frac{3345 u w}{2 t^{42}} + \frac{435 u w}{t^{41}} - \frac{2175 u w}{2 t^{40}} - \frac{1473 u w}{t^{39}} + \frac{459 u w}{t^{38}} + \frac{2438 u w}{t^{37}} + \frac{203 u w}{2 t^{36}} - \frac{2278 u w}{t^{35}} - \frac{2679 u w}{2 t^{34}} + \\
& \frac{1261 u w}{t^{33}} + \frac{7139 u w}{2 t^{32}} - \frac{1344 u w}{t^{31}} - \frac{6489 u w}{2 t^{30}} - \frac{557 u w}{t^{29}} + \frac{2371 u w}{t^{28}} + \frac{7509 u w}{2 t^{27}} - \frac{6073 u w}{2 t^{26}} - \frac{3482 u w}{t^{25}} + \frac{729 u w}{2 t^{24}} + \\
& \frac{3874 u w}{t^{23}} + \frac{2453 u w}{t^{22}} - \frac{4351 u w}{t^{21}} - \frac{5651 u w}{2 t^{20}} + \frac{3113 u w}{2 t^{19}} + \frac{8521 u w}{2 t^{18}} + \frac{1407 u w}{2 t^{17}} - \frac{9259 u w}{2 t^{16}} - \frac{1866 u w}{t^{15}} + \frac{5751 u w}{2 t^{14}} + \\
& \frac{3111 u w}{t^{13}} - \frac{723 u w}{t^{12}} - \frac{3714 u w}{t^{11}} - \frac{1349 u w}{2 t^{10}} + \frac{5753 u w}{2 t^9} + \frac{1538 u w}{t^8} - \frac{1119 u w}{t^7} - \frac{4369 u w}{2 t^6} + \frac{229 u w}{t^5} + \frac{1482 u w}{t^4} + \frac{384 u w}{t^3} - \\
& \frac{769 u w}{2 t^2} - \frac{401 u w}{t} - 218 t u w + \frac{563}{2} t^2 u w + 1053 t^3 u w + \frac{1253}{2} t^4 u w - 1858 t^5 u w - 1366 t^6 u w + 1193 t^7 u w + \\
& \frac{5237}{2} t^8 u w + 173 t^9 u w - 3516 t^{10} u w - \frac{2929}{2} t^{11} u w + \frac{5757}{2} t^{12} u w + 2952 t^{13} u w - 969 t^{14} u w - 4497 t^{15} u w - \\
& \frac{1347}{2} t^{16} u w + 4598 t^{17} u w + \frac{3707}{2} t^{18} u w - \frac{4259}{2} t^{19} u w - \frac{8997}{2} t^{20} u w + \frac{1979}{2} t^{21} u w + \frac{9563}{2} t^{22} u w + 453 t^{23} u w - \\
& 2721 t^{24} u w - 3788 t^{25} u w + \frac{5531}{2} t^{26} u w + 3606 t^{27} u w - \frac{1591}{2} t^{28} u w - \frac{5293}{2} t^{29} u w - 2217 t^{30} u w + 3103 t^{31} u w + \\
& \frac{4597}{2} t^{32} u w - 1468 t^{33} u w - \frac{4463}{2} t^{34} u w - 437 t^{35} u w + \frac{4699}{2} t^{36} u w + 1134 t^{37} u w - \frac{3199}{2} t^{38} u w - 1236 t^{39} u w + \\
& 237 t^{40} u w + 1575 t^{41} u w + \frac{795}{2} t^{42} u w - 1515 t^{43} u w - \frac{185}{2} t^{44} u w + \frac{275}{2} t^{45} u w + \frac{1819}{2} t^{46} u w + \frac{33}{2} t^{47} u w - \\
& 1007 t^{48} u w + 304 t^{49} u w + \frac{39}{2} t^{50} u w + \frac{1011}{2} t^{51} u w - \frac{493}{2} t^{52} u w - 338 t^{53} u w + 216 t^{54} u w - \frac{139}{2} t^{55} u w + 283 t^{56} u w - \\
& 234 t^{57} u w - 53 t^{58} u w + 116 t^{59} u w - \frac{119}{2} t^{60} u w + \frac{169}{2} t^{61} u w - \frac{127}{2} t^{62} u w - \frac{29}{2} t^{63} u w + \frac{63}{2} t^{64} u w - 8 t^{65} u w \}
\end{aligned}$$

PrintProfile[];

Together: called 1778 times, time in 1079.08/1079.08

Parents:

(1778) 1079.080/ 1079.080 under CF

DP: called 1110 times, time in 26.28/26.28

Parents:

(370) 9.756/ 9.756 under Nuc
 (370) 8.113/ 8.113 under Nwc
 (370) 8.411/ 8.411 under Nwu

CF: called 1778 times, time in 13.525/1092.6

Parents:

(370) 2.547/ 100.439 under m
 (370) 3.204/ 168.093 under Nuc
 (370) 2.730/ 151.597 under Nwc
 (370) 4.014/ 640.925 under Nwu
 (298) 1.030/ 31.550 under z

Children:

(1778) 1079.080/ 1079.080 above Together

m: called 370 times, time in 5.481/1098.76

Parents:

(370) 5.481/ 1098.760 under z

Children:

(370) 2.547/ 100.439 above CF
 (370) 1.313/ 179.162 above Nuc
 (370) 1.331/ 161.041 above Nwc
 (370) 3.305/ 652.641 above Nwu

Nwu: called 370 times, time in 3.305/652.641

Parents:

(370) 3.305/ 652.641 under m

Children:

(370) 4.014/ 640.925 above CF
 (370) 8.411/ 8.411 above DP

Nwc: called 370 times, time in 1.331/161.041

Parents:

(370) 1.331/ 161.041 under m

Children:

(370) 2.730/ 151.597 above CF
 (370) 8.113/ 8.113 above DP

Nuc: called 370 times, time in 1.313/179.162

Parents:

(370) 1.313/ 179.162 under m

Children:

(370) 3.204/ 168.093 above CF

(370) 9.756/ 9.756 above DP

z: called 1 times, time in 0.389/1130.7

Parents:

(1) 0.389/ 1130.700 under ProfileRoot

Children:

(298) 1.030/ 31.550 above CF

(370) 5.481/ 1098.760 above m

ProfileRoot: called 0 times, time in 0./0.

Children:

(1) 0.389/ 1130.700 above z