Multi-headed Lattice Green Function (N = 4, M = 3)

ODE

$Out[\bullet]=$ $\bigl(756 + 658\,107\,072\,w - 749\,920\,296\,960\,w^2 + 111\,850\,497\,389\,887\,488\,w^3 -$
$166\,498\,086\,762\,886\,201\,344\,w^4 - 781\,156\,297\,810\,381\,520\,240\,640\,w^5 +$
$1\,637\,147\,560\,168\,901\,326\,135\,099\,392\,w^6 - 732\,231\,540\,023\,730\,620\,969\,986\,818\,048\,w^7 -$
$149\,697\,886\,463\,404\,317\,932\,617\,973\,366\,784\,w^8 + 96\,719\,208\,505\,536\,419\,841\,142\,621\,892\,247\,552\,w^9 -$
$17\,986\,272\,310\,903\,846\,816\,671\,667\,502\,362\,656\,768\,w^{10} +$
$1\,365\,121\,772\,758\,889\,406\,361\,975\,817\,513\,893\,625\,856\,w^{11} +$
$266\,982\,380\,934\,205\,139\,034\,767\,194\,888\,213\,610\,102\,784\,w^{12} -$
$3\,451\,537\,920\,763\,342\,815\,087\,344\,036\,232\,525\,206\,519\,808\,w^{13} -$
$57\,677\,198\,298\,608\,369\,079\,887\,772\,175\,160\,628\,008\,189\,952\,w^{14} +$
$655\,787\,571\,926\,373\,008\,384\,765\,243\,492\,546\,204\,588\,310\,528\,w^{15} -$
$241\,642\,117\,251\,606\,275\,763\,798\,810\,128\,911\,651\,647\,258\,624\,w^{16}\bigr)\,\Theta_w^8 +$
$\bigl(-1512 - 1\,985\,050\,368\,w - 6\,350\,035\,230\,720\,w^2 - 557\,203\,438\,524\,432\,384\,w^3 -$
$587\,179\,135\,837\,113\,679\,872\,w^4 + 6\,373\,155\,470\,045\,165\,823\,983\,616\,w^5 -$
$1\,292\,611\,484\,404\,060\,407\,000\,465\,408\,w^6 - 5\,768\,579\,650\,367\,308\,639\,843\,349\,692\,416\,w^7 +$
$1\,382\,427\,013\,757\,614\,047\,365\,601\,869\,955\,072\,w^8 + 358\,992\,894\,157\,107\,285\,438\,601\,960\,070\,578\,176\,w^9 -$
$53\,119\,839\,081\,791\,910\,699\,130\,795\,605\,268\,365\,312\,w^{10} +$
$20\,033\,688\,987\,472\,672\,410\,340\,587\,286\,921\,796\,911\,104\,w^{11} +$
$1\,070\,184\,586\,795\,418\,191\,307\,064\,402\,944\,853\,050\,130\,432\,w^{12} -$
$47\,857\,531\,084\,168\,298\,968\,105\,213\,313\,896\,536\,229\,281\,792\,w^{13} -$
$270\,884\,195\,420\,762\,288\,774\,538\,561\,958\,062\,360\,455\,282\,688\,w^{14} +$
$5\,786\,930\,575\,834\,638\,459\,669\,201\,820\,980\,856\,382\,306\,648\,064\,w^{15} -$
$1\,933\,136\,938\,012\,850\,206\,110\,390\,481\,031\,293\,213\,178\,068\,992\,w^{16}\bigr)\,\Theta_w^7 +$
$\bigl(1113 + 1\,950\,259\,584\,w + 6\,216\,682\,061\,824\,w^2 + 988\,841\,093\,180\,162\,048\,w^3 +$
$1\,233\,270\,686\,793\,691\,299\,840\,w^4 - 9\,715\,936\,946\,399\,911\,434\,256\,384\,w^5 -$
$7\,752\,074\,094\,169\,934\,619\,780\,055\,040\,w^6 - 3\,292\,303\,250\,603\,115\,641\,274\,504\,314\,880\,w^7 +$
$6\,432\,398\,522\,881\,878\,319\,620\,478\,709\,268\,480\,w^8 + 1\,442\,519\,265\,201\,053\,822\,094\,460\,496\,124\,051\,456\,w^9 -$
$81\,315\,393\,847\,369\,615\,391\,288\,576\,991\,201\,067\,008\,w^{10} +$
$46\,854\,607\,085\,100\,541\,227\,643\,541\,228\,521\,577\,775\,104\,w^{11} +$
$484\,722\,323\,648\,843\,742\,960\,229\,713\,378\,845\,655\,040\,000\,w^{12} -$
$230\,657\,489\,060\,094\,958\,856\,963\,994\,975\,994\,903\,435\,149\,312\,w^{13} -$
$720\,571\,084\,999\,990\,630\,257\,768\,886\,154\,063\,035\,548\,827\,648\,w^{14} +$
$22\,027\,520\,447\,398\,165\,760\,511\,055\,419\,885\,169\,351\,394\,852\,864\,w^{15} -$
$6\,663\,616\,997\,264\,781\,396\,236\,424\,132\,096\,584\,504\,800\,444\,416\,w^{16}\bigr)\,\Theta_w^6 +$
$\bigl(-357 - 789\,151\,104\,w - 10\,558\,964\,416\,512\,w^2 - 679\,933\,490\,467\,176\,448\,w^3 -$
$287\,227\,915\,264\,289\,931\,264\,w^4 + 14\,427\,253\,172\,957\,536\,013\,254\,656\,w^5 +$
$3\,092\,284\,696\,452\,480\,308\,007\,141\,376\,w^6 + 905\,311\,608\,923\,360\,926\,047\,701\,827\,584\,w^7 +$
$14\,621\,774\,397\,415\,013\,636\,807\,083\,954\,274\,304\,w^8 + 1\,520\,148\,020\,883\,568\,461\,909\,863\,756\,948\,570\,112\,$
$w^9 - 386\,791\,883\,303\,174\,384\,286\,527\,316\,852\,952\,006\,656\,w^{10} +$
$55\,223\,977\,247\,937\,670\,737\,556\,473\,181\,100\,776\,095\,744\,w^{11} -$
$3\,961\,198\,864\,716\,838\,655\,960\,160\,400\,530\,693\,479\,727\,104\,w^{12} -$
$595\,909\,152\,288\,030\,158\,390\,074\,172\,187\,987\,674\,363\,068\,416\,w^{13} -$
$1\,344\,613\,983\,895\,642\,776\,006\,711\,946\,247\,382\,448\,056\,827\,904\,w^{14} +$
$46\,737\,381\,677\,309\,460\,398\,827\,589\,903\,959\,671\,231\,607\,734\,272\,w^{15} -$
$12\,917\,784\,851\,408\,785\,491\,873\,078\,058\,141\,402\,044\,309\,700\,608\,w^{16}\bigr)\,\Theta_w^5 +$

$$\Big(42 + 103\,505\,472\,w + 4\,717\,152\,813\,056\,w^2 + 229\,951\,271\,138\,492\,416\,w^3 +$$
$$33\,452\,654\,058\,350\,313\,472\,w^4 - 3\,519\,629\,264\,891\,117\,955\,973\,120\,w^5 -$$
$$8\,712\,355\,168\,877\,862\,347\,467\,653\,120\,w^6 + 3\,183\,462\,774\,294\,546\,535\,677\,280\,911\,360\,w^7 +$$
$$12\,662\,024\,101\,532\,041\,005\,416\,571\,287\,371\,776\,w^8 + 91\,457\,574\,708\,638\,075\,983\,201\,720\,533\,516\,288\,w^9 -$$
$$586\,373\,716\,393\,067\,719\,463\,798\,499\,745\,499\,971\,584\,w^{10} +$$
$$45\,402\,712\,266\,053\,628\,419\,392\,613\,379\,787\,913\,691\,136\,w^{11} -$$
$$9\,548\,218\,855\,973\,838\,530\,825\,534\,106\,648\,111\,229\,173\,760\,w^{12} -$$
$$910\,171\,319\,762\,953\,713\,098\,938\,394\,074\,694\,947\,157\,573\,632\,w^{13} -$$
$$1\,695\,248\,459\,973\,650\,411\,462\,298\,355\,247\,964\,543\,229\,362\,176\,w^{14} +$$
$$60\,316\,818\,440\,945\,087\,853\,828\,024\,483\,516\,860\,568\,289\,935\,360\,w^{15} -$$
$$15\,391\,679\,930\,285\,039\,325\,517\,386\,362\,534\,096\,505\,705\,332\,736\,w^{16}\Big)\,\Theta_w^4 +$$

$$\Big(-212\,352\,w - 41\,049\,243\,648\,w^2 + 8\,757\,517\,736\,738\,816\,w^3 - 20\,173\,834\,021\,513\,461\,760\,w^4 +$$
$$285\,697\,925\,187\,496\,921\,006\,080\,w^5 - 5\,192\,831\,041\,959\,280\,753\,355\,259\,904\,w^6 +$$
$$1\,854\,167\,396\,972\,337\,514\,541\,117\,079\,552\,w^7 + 7\,611\,731\,718\,211\,226\,366\,541\,506\,826\,731\,520\,w^8 -$$
$$1\,132\,092\,616\,093\,392\,427\,901\,870\,092\,654\,215\,168\,w^9 -$$
$$573\,360\,955\,845\,607\,449\,871\,633\,552\,338\,403\,196\,928\,w^{10} +$$
$$31\,196\,974\,018\,934\,147\,496\,719\,981\,299\,967\,906\,021\,376\,w^{11} -$$
$$10\,343\,484\,480\,536\,631\,324\,792\,615\,211\,856\,556\,940\,328\,960\,w^{12} -$$
$$850\,871\,471\,160\,179\,197\,799\,997\,784\,539\,641\,065\,269\,886\,976\,w^{13} -$$
$$1\,366\,110\,491\,586\,634\,438\,250\,598\,685\,972\,842\,495\,483\,052\,032\,w^{14} +$$
$$48\,462\,627\,453\,914\,171\,613\,580\,503\,834\,409\,896\,539\,840\,315\,392\,w^{15} -$$
$$11\,533\,376\,887\,988\,124\,536\,976\,314\,041\,777\,845\,706\,747\,281\,408\,w^{16}\Big)\,\Theta_w^3 +$$

$$\Big(-102\,144\,w + 45\,890\,052\,096\,w^2 + 4\,372\,668\,181\,905\,408\,w^3 - 25\,373\,328\,015\,678\,767\,104\,w^4 -$$
$$35\,860\,603\,273\,980\,739\,059\,712\,w^5 - 2\,609\,042\,215\,039\,715\,330\,989\,490\,176\,w^6 +$$
$$1\,135\,805\,724\,897\,588\,664\,940\,548\,325\,376\,w^7 + 2\,255\,387\,710\,140\,891\,706\,830\,918\,298\,632\,192\,w^8 -$$
$$1\,208\,690\,199\,949\,684\,174\,443\,411\,490\,448\,867\,328\,w^9 -$$
$$334\,887\,474\,030\,943\,944\,488\,261\,929\,148\,495\,167\,488\,w^{10} +$$
$$17\,877\,519\,858\,996\,120\,053\,115\,971\,187\,944\,045\,150\,208\,w^{11} -$$
$$6\,128\,654\,166\,961\,763\,785\,820\,170\,570\,933\,495\,910\,105\,088\,w^{12} -$$
$$476\,288\,752\,718\,822\,257\,140\,265\,748\,951\,023\,617\,535\,115\,264\,w^{13} -$$
$$668\,324\,955\,523\,996\,949\,091\,967\,282\,097\,867\,454\,465\,179\,648\,w^{14} +$$
$$23\,673\,396\,984\,425\,987\,991\,182\,604\,909\,788\,067\,572\,173\,766\,656\,w^{15} -$$
$$5\,303\,121\,535\,030\,477\,312\,378\,786\,039\,652\,035\,049\,432\,285\,184\,w^{16}\Big)\,\Theta_w^2 +$$

$$\Big(-18\,816\,w + 15\,679\,168\,512\,w^2 + 1\,105\,852\,812\,492\,800\,w^3 - 9\,253\,977\,260\,438\,847\,488\,w^4 -$$
$$36\,631\,485\,914\,913\,630\,584\,832\,w^5 - 726\,314\,268\,655\,758\,437\,624\,315\,904\,w^6 +$$
$$358\,748\,918\,263\,218\,897\,800\,795\,258\,880\,w^7 + 286\,918\,040\,829\,362\,957\,086\,349\,485\,670\,400\,w^8 -$$
$$503\,093\,135\,988\,065\,408\,878\,446\,537\,502\,359\,552\,w^9 -$$
$$108\,054\,624\,128\,516\,395\,031\,347\,156\,140\,800\,606\,208\,w^{10} +$$
$$6\,462\,199\,176\,714\,597\,967\,385\,137\,880\,595\,550\,961\,664\,w^{11} -$$
$$1\,918\,694\,308\,581\,208\,774\,434\,293\,647\,882\,766\,231\,011\,328\,w^{12} -$$
$$145\,968\,214\,956\,821\,518\,855\,061\,140\,764\,657\,290\,013\,835\,264\,w^{13} -$$
$$180\,192\,916\,196\,793\,417\,299\,520\,478\,544\,551\,103\,988\,498\,432\,w^{14} +$$
$$6\,427\,990\,896\,954\,765\,589\,117\,223\,123\,312\,617\,887\,797\,084\,160\,w^{15} -$$
$$1\,366\,788\,225\,704\,397\,997\,288\,987\,019\,791\,656\,529\,629\,806\,592\,w^{16}\Big)\,\Theta_w +$$

$$\Big(-1344\,w + 1\,639\,464\,960\,w^2 + 114\,267\,116\,273\,664\,w^3 - 1\,211\,269\,289\,902\,866\,432\,w^4 -$$
$$5\,825\,052\,469\,481\,755\,901\,952\,w^5 - 84\,152\,329\,059\,287\,491\,751\,706\,624\,w^6 +$$
$$48\,938\,139\,253\,071\,191\,076\,992\,188\,416\,w^7 + 3\,045\,898\,181\,345\,513\,899\,617\,530\,413\,056\,w^8 -$$
$$78\,022\,182\,208\,697\,643\,235\,066\,215\,175\,028\,736\,w^9 -$$
$$14\,678\,268\,634\,598\,917\,861\,557\,009\,824\,329\,236\,480\,w^{10} +$$
$$991\,390\,991\,530\,383\,611\,754\,057\,315\,362\,342\,436\,864\,w^{11} -$$

$247\,958\,505\,832\,498\,167\,951\,336\,010\,415\,935\,397\,560\,320\,w^{12}\,-$
$18\,747\,996\,529\,475\,474\,000\,600\,656\,049\,610\,020\,358\,193\,152\,w^{13}\,-$
$20\,499\,222\,726\,707\,352\,515\,629\,191\,626\,716\,497\,397\,678\,080\,w^{14}\,+$
$742\,685\,376\,897\,284\,273\,453\,811\,376\,847\,779\,469\,564\,313\,600\,w^{15}\,-$
$151\,026\,323\,282\,253\,922\,352\,374\,256\,330\,569\,782\,279\,536\,640\,w^{16}\big)$