feasiblecharpolylist[29, (x + 5) ^ 15 (x - 5) ^ 4]

$$\Big\{(-11+x)\,(-5+x)^8\,(-4+x),\ (-5+x)^7\,\left(-216+119\,x-20\,x^2+x^3\right),$$
$$(-5+x)^7\,\left(-212+119\,x-20\,x^2+x^3\right),\ (-5+x)^6\,(-4+x)\,\left(-267+135\,x-21\,x^2+x^3\right),$$
$$(-5+x)^7\,\left(-208+119\,x-20\,x^2+x^3\right),\ (-5+x)^6\,\left(1048-803\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^7\,(-3+x)\,\left(68-17\,x+x^2\right),\ (-5+x)^6\,\left(1028-799\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^6\,(-4+x)\,\left(37-14\,x+x^2\right),$$
$$(-5+x)^6\,\left(992-795\,x+219\,x^2-25\,x^3+x^4\right),\ (-5+x)^7\,\left(-200+119\,x-20\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-5056+4983\,x-1890\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^6\,(-3+x)\,\left(48-15\,x+x^2\right),\ (-5+x)^6\,\left(1016-795\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(972-791\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4916+4935\,x-1886\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^7\,\left(28-13\,x+x^2\right),\ (-7+x)\,(-5+x)^5\,(-4+x)\,(-3+x)\,\left(59-16\,x+x^2\right),$$
$$(-5+x)^6\,\left(988-791\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4996+4951\,x-1886\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,(-3+x)\,\left(-332+153\,x-22\,x^2+x^3\right),\ (-5+x)^6\,(-4+x)\,\left(-251+135\,x-21\,x^2+x^3\right),$$
$$(-5+x)^5\,(-4+x)\,\left(41-14\,x+x^2\right)\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^6\,\left(59-16\,x+x^2\right)\,\left(16-9\,x+x^2\right),\ (-7+x)\,(-5+x)^6\,\left(-136+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(688-601\,x+183\,x^2-23\,x^3+x^4\right),\ (-5+x)^7\,\left(-192+119\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,(-3+x)\,\left(-232+123\,x-20\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4856+4903\,x-1882\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,\left(968-787\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^5\,(-3+x)\,\left(1632-1093\,x+263\,x^2-27\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(976-787\,x+219\,x^2-25\,x^3+x^4\right),\ (-8+x)\,(-5+x)^6\,(-3+x)\,\left(41-14\,x+x^2\right),$$
$$(-5+x)^6\,\left(32-13\,x+x^2\right)\,\left(31-12\,x+x^2\right),\ (-7+x)\,(-5+x)^6\,\left(-132+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(668-597\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(932-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,(-4+x)\,\left(-169+107\,x-19\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4716+4855\,x-1878\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^7\,\left(-188+119\,x-20\,x^2+x^3\right),\ (-7+x)\,(-5+x)^5\,(-3+x)\,\left(-228+123\,x-20\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4772+4863\,x-1878\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(41-14\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-5+x)^6\,\left(948-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,(-4+x)\,(-3+x)\,\left(41-14\,x+x^2\right),$$
$$(-5+x)^5\,(-3+x)\,\left(1604-1089\,x+263\,x^2-27\,x^3+x^4\right),$$
$$(-5+x)^5\,(-4+x)\,\left(1199-918\,x+240\,x^2-26\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(956-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^5\,(-3+x)\,\left(52-15\,x+x^2\right)\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^6\,\left(964-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^4\,(-4+x)\,\left(31-12\,x+x^2\right)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-9+x)^2\,(-5+x)^6\,(-4+x)\,(-3+x),\ (-7+x)\,(-5+x)^6\,\left(-128+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(648-593\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(904-779\,x+219\,x^2-25\,x^3+x^4\right),$$

$$(-7+x)\,(-5+x)^5\,\left(41-14\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-5+x)^5\,\left(-4576+4807\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,\left(912-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,(-3+x)\,\left(1112-839\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(664-593\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4632+4815\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4616+4815\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-8+x)\,(-5+x)^7\,\left(23-12\,x+x^2\right),\ (-7+x)^2\,(-5+x)^5\,(-3+x)\,\left(32-13\,x+x^2\right),$$
$$(-5+x)^5\,\left(-4688+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4672+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4656+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,\left(928-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,(-3+x)\,\left(1128-839\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^5\,(-3+x)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(31-12\,x+x^2\right)\,\left(-152+97\,x-18\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4696+4831\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^6\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-5+x)^4\,(-3+x)\,\left(31-12\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)^5\,(-3+x)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^6\,\left(-124+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(628-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(876-775\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3196+3581\,x-1504\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^5\,\left(636-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4436+4759\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,\left(52-15\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3236+3589\,x-1504\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^5\,(-4+x)\,\left(23-12\,x+x^2\right),$$
$$(-5+x)^5\,\left(-4492+4767\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4476+4767\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^6\,\left(892-775\,x+219\,x^2-25\,x^3+x^4\right),\ (-7+x)^2\,(-5+x)^4\,(-3+x)^2\,\left(52-15\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^5\,\left(652-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^4\,\left(-197+111\,x-19\,x^2+x^3\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4548+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4532+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(-4516+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),\ (-9+x)\,(-5+x)^7\,\left(20-11\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-4+x)\,(-3+x)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,(-3+x)\,\left(-220+123\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,(-4+x)\,\left(821-696\,x+202\,x^2-24\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4604+4783\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^5\,\left(31-12\,x+x^2\right)\,\left(-148+97\,x-18\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)^5\,(-4+x)\,\left(-127+87\,x-17\,x^2+x^3\right),$$

$$(-7+x)\,(-5+x)^4\,(-3+x)\,\left(1108-835\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(748-633\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-9+x)\,(-5+x)^5\,(-3+x)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^4\,(-4+x)\,(-3+x)\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^3\,(-4+x)\,\left(31-12\,x+x^2\right)^3,\ (-7+x)\,(-5+x)^6\,\left(-120+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(608-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^6\,\left(848-771\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3096+3541\,x-1500\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^5\,\left(-88+71\,x-16\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4296+4711\,x-1866\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-8+x)\,(-5+x)^6\,\left(-107+83\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(16-9\,x+x^2\right)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(448-443\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(624-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(17-10\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4336+4719\,x-1866\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^6\,\left(-96+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,(-3+x)\,\left(-152+97\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3176+3557\,x-1500\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^5\,\left(632-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^4\,\left(22\,152-28\,059\,x+14\,057\,x^2-3586\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-8+x)\,(-5+x)^5\,\left(551-522\,x+168\,x^2-22\,x^3+x^4\right),$$
$$(-9+x)\,(-5+x)^5\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-3+x)^2\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,(-3+x)\,\left(1072-831\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(640-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^4\,\left(22\,432-28\,155\,x+14\,065\,x^2-3586\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^5\,\left(31-12\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-5+x)^4\,\left(-176+101\,x-18\,x^2+x^3\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^3\,(-3+x)\,\left(-5416+5235\,x-1946\,x^2+348\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-8+x)\,(-7+x)\,(-5+x)^5\,(-3+x)^2,$$
$$(-7+x)\,(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^3\,(-3+x)\,\left(31-12\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(736-629\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^4\,(-3+x)\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)\,(-5+x)^5\,\left(52-15\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^6\,\left(-116+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2956+3493\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^5\,\left(-84+71\,x-16\,x^2+x^3\right),\ (-5+x)^6\,\left(820-767\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,(-4+x)\,\left(-107+83\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(596-581\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^5\,\left(-4156+4663\,x-1862\,x^2+344\,x^3-30\,x^4+x^5\right),$$

$$(-9+x)\,(-5+x)^6\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(436-439\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3036+3509\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^5\,\left(604-581\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^4\,\left(21\,172-27\,583\,x+13\,981\,x^2-3582\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^5\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,(-3+x)\,\left(-148+97\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-4+x)\,\left(551-522\,x+168\,x^2-22\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3092+3517\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3076+3517\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^5\,(-4+x)\,\left(17-10\,x+x^2\right),$$
$$(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(692-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-3+x)\,\left(748-633\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^3\,\left(15\,628-20\,757\,x+11\,005\,x^2-2986\,x^3+438\,x^4-33\,x^5+x^6\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^4\,(-3+x)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3116+3525\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-5+x)^4\,\left(-172+101\,x-18\,x^2+x^3\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^5\,\left(31-12\,x+x^2\right)\,\left(20-11\,x+x^2\right),$$
$$(-9+x)\,(-7+x)^3\,(-5+x)^3\,(-4+x)\,(-3+x)^2,$$
$$(-7+x)\,(-5+x)^3\,(-3+x)\,\left(-5276+5187\,x-1942\,x^2+348\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^3\,(-4+x)\,\left(31-12\,x+x^2\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(708-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^3\,(-3+x)\,\left(31-12\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-5+x)^3\,\left(31-12\,x+x^2\right)^2\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^2\,(-4+x)\,(-3+x)\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)\,(-5+x)^5\,\left(552-577\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(11-8\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^6\,\left(16-11\,x+x^2\right),\ (-5+x)^5\,\left(-3904+4599\,x-1858\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(408-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(568-577\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-9+x)\,(-8+x)\,(-5+x)^6\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(416-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2896+3461\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^5\,\left(-64+57\,x-14\,x^2+x^3\right),$$
$$(-5+x)^5\,\left(-4016+4615\,x-1858\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(424-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^4\,\left(328-349\,x+127\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2936+3469\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^5\,\left(-73+63\,x-15\,x^2+x^3\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^4\,(-3+x)\,\left(16-9\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-2144+2607\,x-1190\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-3008+3477\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$

$$(-7+x)\,(-5+x)^4\,\left(17-10\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(-96+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,(-3+x)\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^3\,\left(15\,208-20\,473\,x+10\,945\,x^2-2982\,x^3+438\,x^4-33\,x^5+x^6\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^4\,(-3+x)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^3\,\left(31-12\,x+x^2\right)\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^5\,\left(31-12\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-3+x)^2\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-3+x)\,\left(736-629\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^3\,\left(31-12\,x+x^2\right)^2\,\left(16-9\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^3\,(-3+x)^2\,\left(31-12\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^5\,\left(524-573\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^5\,\left(-76+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(388-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^6\,\left(12-9\,x+x^2\right),$$
$$(-5+x)^5\,\left(-3764+4551\,x-1854\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^4\,(-4+x)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2756+3413\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^5\,\left(548-573\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(404-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2812+3421\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2796+3421\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-3+x)\,\left(692-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(412-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^3\,(-4+x)\,\left(-73+63\,x-15\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2868+3429\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^4\,(-3+x)\,\left(20-11\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^3\,\left(-127+87\,x-17\,x^2+x^3\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-2084+2575\,x-1186\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^4\,\left(17-10\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^3\,\left(31-12\,x+x^2\right)\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-4+x)\,(-3+x)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-3+x)\,\left(708-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^3\,(-4+x)\,\left(31-12\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-3+x)^2\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^2\,(-3+x)\,\left(31-12\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)\,(-4+x)\,(-3+x)^2\,\left(31-12\,x+x^2\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^5\,\left(8-7\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(368-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(512-569\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(376-427\,x+151\,x^2-21\,x^3+x^4\right),$$

$$(-7+x)\,(-5+x)^4\,\left(-2616+3365\,x-1484\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^6\,\left(13-10\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(11-8\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(384-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2672+3373\,x-1484\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-1976+2527\,x-1182\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^4\,\left(-56+53\,x-14\,x^2+x^3\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(16-9\,x+x^2\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,(-3+x)\,\left(-96+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(400-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(31-12\,x+x^2\right)\,\left(-64+57\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-3+x)\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^2\,\left(31-12\,x+x^2\right)\,\left(328-349\,x+127\,x^2-19\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^4\,(-3+x)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-3+x)\,\left(31-12\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^4\,(-5+x)^2\,(-3+x)^3,\ (-7+x)^2\,(-5+x)^5\,\left(-68+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(348-423\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^5\,\left(484-565\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(356-423\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^4\,\left(-2476+3317\,x-1480\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-1836+2479\,x-1178\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^4\,(-4+x)\,\left(13-10\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(11-8\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(268-317\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(31-12\,x+x^2\right)\,\left(12-9\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^3\,(-3+x)\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-4+x)\,\left(31-12\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-1916+2495\,x-1178\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^2\,(-3+x)\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(17-10\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^2\,(-4+x)\,(-3+x)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^4\,(-5+x)\,(-3+x)^2\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^6\,(-4+x)\,(-3+x)^3,\ (-7+x)^2\,(-5+x)^5\,\left(-64+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(328-419\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^5\,\left(-57+63\,x-15\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^3\,\left(-1696+2431\,x-1174\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^4\,\left(-48+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(31-12\,x+x^2\right)\,\left(8-7\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^4\,\left(-43+47\,x-13\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(256-313\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)^3\,(-5+x)^3\,(-3+x)\,\left(11-8\,x+x^2\right),$$

$$(-7+x)^3\,(-5+x)^2\,\left(-1304+1829\,x-928\,x^2+218\,x^3-24\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(17-10\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-7+x)^4\,(-5+x)^2\,(-3+x)\,\left(-64+57\,x-14\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)\,(-3+x)\,\left(328-349\,x+127\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^5\,(-5+x)\,(-3+x)^2\,\left(16-9\,x+x^2\right),\ (-7+x)^2\,(-5+x)^5\,\left(-60+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^4\,\left(-44+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,(-4+x)\,\left(-57+63\,x-15\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(236-309\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(244-309\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^4\,(-5+x)^2\,(-4+x)\,\left(-43+47\,x-13\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^2\,\left(11-8\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^3\,(-3+x)\,\left(12-9\,x+x^2\right),$$
$$(-7+x)^5\,(-5+x)\,(-4+x)\,(-3+x)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^4\,\left(272-411\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)^3\,(-5+x)^5\,(-1+x),\ (-7+x)^3\,(-5+x)^3\,\left(208-305\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(216-305\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^4\,(-5+x)^3\,\left(-32+39\,x-12\,x^2+x^3\right),\ (-7+x)^5\,(-5+x)^2\,(-3+x)\,\left(8-7\,x+x^2\right),$$
$$(-7+x)^4\,(-5+x)^2\,\left(16-9\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^4\,\left(-36+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^3\,\left(188-301\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^5\,(-5+x)^3\,(-4+x)\,(-1+x),\ (-7+x)^4\,(-5+x)^2\,\left(148-223\,x+99\,x^2-17\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^4\,\left(-32+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^3\,\left(-24+39\,x-12\,x^2+x^3\right),\ (-7+x)^4\,(-5+x)^4\,\left(4-7\,x+x^2\right)\Big\}$$

dim14list =

$$\Big\{(-11+x)\,(-5+x)^{12}\,(-4+x)\,(5+x)^{15},\ (-5+x)^{11}\,(5+x)^{15}\,\left(-216+119\,x-20\,x^2+x^3\right),$$
$$(-5+x)^{11}\,(5+x)^{15}\,\left(-212+119\,x-20\,x^2+x^3\right),\ (-5+x)^{10}\,(-4+x)\,(5+x)^{15}$$
$$\left(-267+135\,x-21\,x^2+x^3\right),\ (-5+x)^{11}\,(5+x)^{15}\,\left(-208+119\,x-20\,x^2+x^3\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(1048-803\,x+219\,x^2-25\,x^3+x^4\right),\ (-5+x)^{11}\,(-3+x)$$
$$(5+x)^{15}\,\left(68-17\,x+x^2\right),\ (-5+x)^{10}\,(5+x)^{15}\,\left(1028-799\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{10}\,(-4+x)\,(5+x)^{15}\,\left(37-14\,x+x^2\right),\ (-5+x)^{10}\,(5+x)^{15}$$
$$\left(992-795\,x+219\,x^2-25\,x^3+x^4\right),\ (-5+x)^{11}\,(5+x)^{15}\,\left(-200+119\,x-20\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-5056+4983\,x-1890\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^{10}\,(-3+x)\,(5+x)^{15}\,\left(48-15\,x+x^2\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(1016-795\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(972-791\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4916+4935\,x-1886\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^{11}\,(5+x)^{15}\,\left(28-13\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^9\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(59-16\,x+x^2\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(988-791\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4996+4951\,x-1886\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(-3+x)\,(5+x)^{15}\,\left(-332+153\,x-22\,x^2+x^3\right),$$

$$(-5+x)^{10}\,(-4+x)\,(5+x)^{15}\,\left(-251+135\,x-21\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(-4+x)\,(5+x)^{15}\,\left(41-14\,x+x^2\right)\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(59-16\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-136+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(688-601\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{11}\,(5+x)^{15}\,\left(-192+119\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(-232+123\,x-20\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4856+4903\,x-1882\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(968-787\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(1632-1093\,x+263\,x^2-27\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(976-787\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^{10}\,(-3+x)\,(5+x)^{15}\,\left(41-14\,x+x^2\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(32-13\,x+x^2\right)\,\left(31-12\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-132+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(668-597\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(932-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{9}\,(-4+x)\,(5+x)^{15}\,\left(-169+107\,x-19\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4716+4855\,x-1878\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{11}\,(5+x)^{15}\,\left(-188+119\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(-228+123\,x-20\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4772+4863\,x-1878\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(41-14\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(948-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^{2}\,(-5+x)^{8}\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(41-14\,x+x^2\right),$$
$$(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(1604-1089\,x+263\,x^2-27\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(-4+x)\,(5+x)^{15}\,\left(1199-918\,x+240\,x^2-26\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(956-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(52-15\,x+x^2\right)\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(964-783\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^{8}\,(-4+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-9+x)^{2}\,(-5+x)^{10}\,(-4+x)\,(-3+x)\,(5+x)^{15},$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-128+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(648-593\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(904-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(41-14\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4576+4807\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(912-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(1112-839\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(664-593\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4632+4815\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4616+4815\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-8+x)\,(-5+x)^{11}\,(5+x)^{15}\,\left(23-12\,x+x^2\right),$$

$$(-7+x)^2\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(32-13\,x+x^2\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4688+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4672+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4656+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(928-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(1128-839\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-152+97\,x-18\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4696+4831\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-124+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(628-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(876-775\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3196+3581\,x-1504\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(636-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4436+4759\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(52-15\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3236+3589\,x-1504\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^9\,(-4+x)\,(5+x)^{15}\,\left(23-12\,x+x^2\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4492+4767\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4476+4767\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(892-775\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(-3+x)^2\,(5+x)^{15}\,\left(52-15\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(652-589\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(-197+111\,x-19\,x^2+x^3\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4548+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4532+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4516+4775\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^{11}\,(5+x)^{15}\,\left(20-11\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(-220+123\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^8\,(-4+x)\,(5+x)^{15}\,\left(821-696\,x+202\,x^2-24\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4604+4783\,x-1870\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-148+97\,x-18\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)^9\,(-4+x)\,(5+x)^{15}\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(1108-835\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(748-633\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-9+x)\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^8\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right),$$
$$(-5+x)^7\,(-4+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^3,$$

$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-120+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(608-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(848-771\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-3096+3541\,x-1500\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^{9}\,(5+x)^{15}\,\left(-88+71\,x-16\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4296+4711\,x-1866\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-8+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-107+83\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(16-9\,x+x^2\right)\,\left(-197+111\,x-19\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(5+x)^{15}\,\left(448-443\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(624-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(17-10\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4336+4719\,x-1866\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-96+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(-152+97\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-3176+3557\,x-1500\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(632-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{8}\,(5+x)^{15}\,\left(22\,152-28\,059\,x+14\,057\,x^2-3586\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-8+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(551-522\,x+168\,x^2-22\,x^3+x^4\right),$$
$$(-9+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^{7}\,(-3+x)^2\,(5+x)^{15}\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(1072-831\,x+223\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(640-585\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{8}\,(5+x)^{15}\,\left(22\,432-28\,155\,x+14\,065\,x^2-3586\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-5+x)^{8}\,(5+x)^{15}\,\left(-176+101\,x-18\,x^2+x^3\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{7}\,(-3+x)\,(5+x)^{15}\,\left(-5416+5235\,x-1946\,x^2+348\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-8+x)\,(-7+x)\,(-5+x)^{9}\,(-3+x)^2\,(5+x)^{15},$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{7}\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-5+x)^{8}\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(736-629\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(52-15\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-116+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-2956+3493\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^{9}\,(5+x)^{15}\,\left(-84+71\,x-16\,x^2+x^3\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(820-767\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(-4+x)\,(5+x)^{15}\,\left(-107+83\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(596-581\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4156+4663\,x-1862\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(5+x)^{15}\,\left(436-439\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-3036+3509\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$

$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(604-581\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(21\,172-27\,583\,x+13\,981\,x^2-3582\,x^3+494\,x^4-35\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^9\,(5+x)^{15}\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(-148+97\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-4+x)\,(5+x)^{15}\,\left(551-522\,x+168\,x^2-22\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3092+3517\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3076+3517\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^9\,(-4+x)\,(5+x)^{15}\,\left(17-10\,x+x^2\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(692-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(748-633\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(15\,628-20\,757\,x+11\,005\,x^2-2986\,x^3+438\,x^4-33\,x^5+x^6\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3116+3525\,x-1496\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(-172+101\,x-18\,x^2+x^3\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(20-11\,x+x^2\right),$$
$$(-9+x)\,(-7+x)^3\,(-5+x)^7\,(-4+x)\,(-3+x)^2\,(5+x)^{15},$$
$$(-7+x)\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(-5276+5187\,x-1942\,x^2+348\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^7\,(-4+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(708-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^6\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(552-577\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(11-8\,x+x^2\right)\,\left(-256+127\,x-20\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{10}\,(5+x)^{15}\,\left(16-11\,x+x^2\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-3904+4599\,x-1858\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(408-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(568-577\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-9+x)\,(-8+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(416-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2896+3461\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(-64+57\,x-14\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-4016+4615\,x-1858\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(424-435\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(328-349\,x+127\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2936+3469\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(-73+63\,x-15\,x^2+x^3\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(16-9\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-2144+2607\,x-1190\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-3008+3477\,x-1492\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(17-10\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-96+75\,x-16\,x^2+x^3\right),$$

$$(-7+x)^3\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(-104+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(15\,208-20\,473\,x+10\,945\,x^2-2982\,x^3+438\,x^4-33\,x^5+x^6\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-8+x)\,(-5+x)^9\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-3+x)^2\,(5+x)^{15}\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(736-629\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2\,\left(16-9\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^7\,(-3+x)^2\,(5+x)^{15}\,\left(31-12\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(524-573\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^9\,(5+x)^{15}\,\left(-76+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(388-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-9+x)\,(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(12-9\,x+x^2\right),$$
$$(-5+x)^9\,(5+x)^{15}\,\left(-3764+4551\,x-1854\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^8\,(-4+x)\,(5+x)^{15}\,\left(11-8\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2756+3413\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(548-573\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(404-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2812+3421\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2796+3421\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(692-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(412-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^7\,(-4+x)\,(5+x)^{15}\,\left(-73+63\,x-15\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2868+3429\,x-1488\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(20-11\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(-127+87\,x-17\,x^2+x^3\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-2084+2575\,x-1186\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(17-10\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)\,(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(708-625\,x+187\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^7\,(-4+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-3+x)^2\,(5+x)^{15}\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^6\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^5\,(-4+x)\,(-3+x)^2\,(5+x)^{15}\,\left(31-12\,x+x^2\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^9\,(5+x)^{15}\,\left(8-7\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(368-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(512-569\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(376-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2616+3365\,x-1484\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(13-10\,x+x^2\right),$$

$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(11-8\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(384-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2672+3373\,x-1484\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-1976+2527\,x-1182\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^8\,(5+x)^{15}\,\left(-56+53\,x-14\,x^2+x^3\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(16-9\,x+x^2\right)\,\left(-127+87\,x-17\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(-96+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(400-427\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(-64+57\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-3+x)\,(5+x)^{15}\,\left(488-471\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^6\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(328-349\,x+127\,x^2-19\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^8\,(-3+x)\,(5+x)^{15}\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(16-9\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^4\,(-5+x)^6\,(-3+x)^3\,(5+x)^{15},$$
$$(-7+x)^2\,(-5+x)^9\,(5+x)^{15}\,\left(-68+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(348-423\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(484-565\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(356-423\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{15}\,\left(-2476+3317\,x-1480\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-1836+2479\,x-1178\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^8\,(-4+x)\,(5+x)^{15}\,\left(13-10\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(11-8\,x+x^2\right)\,\left(-172+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^7\,(5+x)^{15}\,\left(268-317\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(12-9\,x+x^2\right),$$
$$(-7+x)^3\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-4+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(11-8\,x+x^2\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-1916+2495\,x-1178\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^6\,(-3+x)\,(5+x)^{15}\,\left(468-467\,x+155\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(17-10\,x+x^2\right)\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^6\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(17-10\,x+x^2\right),$$
$$(-7+x)^4\,(-5+x)^5\,(-3+x)^2\,(5+x)^{15}\,\left(-116+79\,x-16\,x^2+x^3\right),$$
$$(-7+x)^6\,(-5+x)^4\,(-4+x)\,(-3+x)^3\,(5+x)^{15},$$
$$(-7+x)^2\,(-5+x)^9\,(5+x)^{15}\,\left(-64+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(328-419\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)\,(-5+x)^9\,(5+x)^{15}\,\left(-57+63\,x-15\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^7\,(5+x)^{15}\,\left(-1696+2431\,x-1174\,x^2+256\,x^3-26\,x^4+x^5\right),$$
$$(-7+x)^3\,(-5+x)^8\,(5+x)^{15}\,\left(-48+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^7\,(5+x)^{15}\,\left(31-12\,x+x^2\right)\,\left(8-7\,x+x^2\right),$$
$$(-8+x)\,(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\,\left(-43+47\,x-13\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^7\,(5+x)^{15}\,\left(256-313\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-8+x)\,(-7+x)^3\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\,\left(11-8\,x+x^2\right),$$

```
(-7 + x)^3 (-5 + x)^6 (5 + x)^15 (-1304 + 1829 x - 928 x^2 + 218 x^3 - 24 x^4 + x^5),
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (17 - 10 x + x^2) (16 - 9 x + x^2),
(-7 + x)^4 (-5 + x)^6 (-3 + x) (5 + x)^15 (-64 + 57 x - 14 x^2 + x^3),
(-7 + x)^4 (-5 + x)^5 (-3 + x) (5 + x)^15 (328 - 349 x + 127 x^2 - 19 x^3 + x^4),
(-7 + x)^5 (-5 + x)^5 (-3 + x)^2 (5 + x)^15 (16 - 9 x + x^2),
(-7 + x)^2 (-5 + x)^9 (5 + x)^15 (-60 + 71 x - 16 x^2 + x^3),
(-7 + x)^3 (-5 + x)^8 (5 + x)^15 (-44 + 53 x - 14 x^2 + x^3),
(-7 + x)^3 (-5 + x)^7 (-4 + x) (5 + x)^15 (-57 + 63 x - 15 x^2 + x^3),
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (236 - 309 x + 123 x^2 - 19 x^3 + x^4),
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (244 - 309 x + 123 x^2 - 19 x^3 + x^4),
(-7 + x)^4 (-5 + x)^6 (-4 + x) (5 + x)^15 (-43 + 47 x - 13 x^2 + x^3),
(-7 + x)^3 (-5 + x)^6 (5 + x)^15 (11 - 8 x + x^2) (-116 + 79 x - 16 x^2 + x^3),
(-7 + x)^4 (-5 + x)^7 (-3 + x) (5 + x)^15 (12 - 9 x + x^2),
(-7 + x)^5 (-5 + x)^5 (-4 + x) (-3 + x) (5 + x)^15 (11 - 8 x + x^2),
(-7 + x)^2 (-5 + x)^8 (5 + x)^15 (272 - 411 x + 151 x^2 - 21 x^3 + x^4),
(-8 + x) (-7 + x)^3 (-5 + x)^9 (-1 + x) (5 + x)^15,
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (208 - 305 x + 123 x^2 - 19 x^3 + x^4),
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (216 - 305 x + 123 x^2 - 19 x^3 + x^4),
(-7 + x)^4 (-5 + x)^7 (5 + x)^15 (-32 + 39 x - 12 x^2 + x^3),
(-7 + x)^5 (-5 + x)^6 (-3 + x) (5 + x)^15 (8 - 7 x + x^2),
(-7 + x)^4 (-5 + x)^6 (5 + x)^15 (16 - 9 x + x^2) (11 - 8 x + x^2),
(-7 + x)^3 (-5 + x)^8 (5 + x)^15 (-36 + 53 x - 14 x^2 + x^3),
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (188 - 301 x + 123 x^2 - 19 x^3 + x^4),
(-7 + x)^5 (-5 + x)^7 (-4 + x) (-1 + x) (5 + x)^15,
(-7 + x)^4 (-5 + x)^6 (5 + x)^15 (148 - 223 x + 99 x^2 - 17 x^3 + x^4),
(-7 + x)^3 (-5 + x)^8 (5 + x)^15 (-32 + 53 x - 14 x^2 + x^3), (-7 + x)^4 (-5 + x)^7
 (5 + x)^15 (-24 + 39 x - 12 x^2 + x^3), (-7 + x)^4 (-5 + x)^8 (5 + x)^15 (4 - 7 x + x^2)};
```

```
Length[dim14list]
```

```
301
```

modfilter[dim14list, chiSmod128n29, 128]

$$\Big\{(-11+x)\,(-5+x)^{12}\,(-4+x)\,(5+x)^{15},\ (-5+x)^{11}\,(-3+x)\,(5+x)^{15}\,\left(68-17\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{10}\,(-3+x)\,(5+x)^{15}\,\left(48-15\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{9}\,(-4+x)\,(5+x)^{15}\,\left(-169+107\,x-19\,x^2+x^3\right),$$
$$(-5+x)^{11}\,(5+x)^{15}\,\left(-188+119\,x-20\,x^2+x^3\right),$$
$$(-9+x)^2\,(-5+x)^{10}\,(-4+x)\,(-3+x)\,(5+x)^{15},$$
$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-128+93\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{9}\,(-3+x)\,(5+x)^{15}\,\left(32-13\,x+x^2\right),$$
$$(-5+x)^{9}\,(5+x)^{15}\,\left(-4672+4823\,x-1874\,x^2+344\,x^3-30\,x^4+x^5\right),$$
$$(-5+x)^{10}\,(5+x)^{15}\,\left(928-779\,x+219\,x^2-25\,x^3+x^4\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(-3+x)^2\,(5+x)^{15}\,\left(52-15\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-3176+3557\,x-1500\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(596-581\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-9+x)\,(-5+x)^{10}\,(5+x)^{15}\,\left(-92+75\,x-16\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{6}\,(-4+x)\,(-3+x)\,(5+x)^{15}\,\left(31-12\,x+x^2\right)^2,$$
$$(-7+x)^2\,(-5+x)^{10}\,(5+x)^{15}\,\left(16-11\,x+x^2\right),$$
$$(-9+x)\,(-7+x)^2\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(16-9\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(17-10\,x+x^2\right)\,\left(-176+101\,x-18\,x^2+x^3\right),$$
$$(-7+x)^2\,(-5+x)^{8}\,(5+x)^{15}\,\left(388-431\,x+151\,x^2-21\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\,\left(20-11\,x+x^2\right),$$
$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(-2616+3365\,x-1484\,x^2+298\,x^3-28\,x^4+x^5\right),$$
$$(-8+x)\,(-7+x)^4\,(-5+x)^{6}\,(-3+x)^3\,(5+x)^{15},$$
$$(-7+x)\,(-5+x)^{9}\,(5+x)^{15}\,\left(484-565\,x+183\,x^2-23\,x^3+x^4\right),$$
$$(-7+x)^6\,(-5+x)^{4}\,(-4+x)\,(-3+x)^3\,(5+x)^{15},$$
$$(-7+x)^2\,(-5+x)^{9}\,(5+x)^{15}\,\left(-64+71\,x-16\,x^2+x^3\right),$$
$$(-7+x)^3\,(-5+x)^{7}\,(5+x)^{15}\,\left(256-313\,x+123\,x^2-19\,x^3+x^4\right),$$
$$(-7+x)^3\,(-5+x)^{8}\,(5+x)^{15}\,\left(-44+53\,x-14\,x^2+x^3\right),$$
$$(-7+x)^4\,(-5+x)^{7}\,(-3+x)\,(5+x)^{15}\,\left(12-9\,x+x^2\right),$$
$$(-7+x)^5\,(-5+x)^{6}\,(-3+x)\,(5+x)^{15}\,\left(8-7\,x+x^2\right),$$
$$(-7+x)^4\,(-5+x)^{8}\,(5+x)^{15}\,\left(4-7\,x+x^2\right)\Big\}$$

```
dim14listmod128 =
  {(-11 + x) (-5 + x)^12 (-4 + x) (5 + x)^15, (-5 + x)^11 (-3 + x) (5 + x)^15 (68 - 17 x + x^2),
   (-7 + x) (-5 + x)^10 (-3 + x) (5 + x)^15 (48 - 15 x + x^2),
   (-7 + x) (-5 + x)^9 (-4 + x) (5 + x)^15 (-169 + 107 x - 19 x^2 + x^3),
   (-5 + x)^11 (5 + x)^15 (-188 + 119 x - 20 x^2 + x^3),
   (-9 + x)^2 (-5 + x)^10 (-4 + x) (-3 + x) (5 + x)^15, (-7 + x) (-5 + x)^10 (5 + x)^15
    (-128 + 93 x - 18 x^2 + x^3), (-7 + x)^2 (-5 + x)^9 (-3 + x) (5 + x)^15 (32 - 13 x + x^2),
   (-5 + x)^9 (5 + x)^15 (-4672 + 4823 x - 1874 x^2 + 344 x^3 - 30 x^4 + x^5),
   (-5 + x)^10 (5 + x)^15 (928 - 779 x + 219 x^2 - 25 x^3 + x^4),
   (-7 + x)^2 (-5 + x)^8 (-3 + x)^2 (5 + x)^15 (52 - 15 x + x^2),
   (-7 + x) (-5 + x)^8 (5 + x)^15 (-3176 + 3557 x - 1500 x^2 + 298 x^3 - 28 x^4 + x^5),
   (-8 + x) (-5 + x)^8 (-3 + x) (5 + x)^15 (31 - 12 x + x^2)^2,
   (-7 + x) (-5 + x)^9 (5 + x)^15 (596 - 581 x + 183 x^2 - 23 x^3 + x^4),
   (-9 + x) (-5 + x)^10 (5 + x)^15 (-92 + 75 x - 16 x^2 + x^3),
   (-7 + x)^2 (-5 + x)^6 (-4 + x) (-3 + x) (5 + x)^15 (31 - 12 x + x^2)^2,
   (-7 + x)^2 (-5 + x)^10 (5 + x)^15 (16 - 11 x + x^2),
   (-9 + x) (-7 + x)^2 (-5 + x)^8 (-3 + x) (5 + x)^15 (16 - 9 x + x^2),
   (-7 + x) (-5 + x)^8 (5 + x)^15 (17 - 10 x + x^2) (-176 + 101 x - 18 x^2 + x^3),
   (-7 + x)^2 (-5 + x)^8 (5 + x)^15 (388 - 431 x + 151 x^2 - 21 x^3 + x^4),
   (-7 + x)^3 (-5 + x)^8 (-3 + x) (5 + x)^15 (20 - 11 x + x^2),
   (-7 + x) (-5 + x)^8 (5 + x)^15 (-2616 + 3365 x - 1484 x^2 + 298 x^3 - 28 x^4 + x^5),
   (-8 + x) (-7 + x)^4 (-5 + x)^6 (-3 + x)^3 (5 + x)^15,
   (-7 + x) (-5 + x)^9 (5 + x)^15 (484 - 565 x + 183 x^2 - 23 x^3 + x^4),
   (-7 + x)^6 (-5 + x)^4 (-4 + x) (-3 + x)^3 (5 + x)^15,
   (-7 + x)^2 (-5 + x)^9 (5 + x)^15 (-64 + 71 x - 16 x^2 + x^3),
   (-7 + x)^3 (-5 + x)^7 (5 + x)^15 (256 - 313 x + 123 x^2 - 19 x^3 + x^4),
   (-7 + x)^3 (-5 + x)^8 (5 + x)^15 (-44 + 53 x - 14 x^2 + x^3),
   (-7 + x)^4 (-5 + x)^7 (-3 + x) (5 + x)^15 (12 - 9 x + x^2), (-7 + x)^5 (-5 + x)^6
    (-3 + x) (5 + x)^15 (8 - 7 x + x^2), (-7 + x)^4 (-5 + x)^8 (5 + x)^15 (4 - 7 x + x^2)};

Length[dim14listmod128]
31

chi = (-11 + x) (-5 + x)^12 (-4 + x) (5 + x)^15
(-11 + x) (-5 + x)^12 (-4 + x) (5 + x)^15

CoefficientList[feasibleinterlacingpolylist[chi], x]
{{15, 47, -15, 1}, {7, 47, -15, 1}, {-1, 47, -15, 1}, {-9, 47, -15, 1}}
```

```
A = {{-9, 47, -15, 1}, {-1, 47, -15, 1}, {7, 47, -15, 1}, {15, 47, -15, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -9 & 47 & -15 & 1 \\ -1 & 47 & -15 & 1 \\ 7 & 47 & -15 & 1 \\ 15 & 47 & -15 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{-285, 1363, -435, 29}
```

```
Array[c, 4].Transpose[A]
```

```
{-9 c[1] + 47 c[2] - 15 c[3] + c[4], -c[1] + 47 c[2] - 15 c[3] + c[4],
 7 c[1] + 47 c[2] - 15 c[3] + c[4], 15 c[1] + 47 c[2] - 15 c[3] + c[4]}
```

```
Array[c, 4].g
```

```
-285 c[1] + 1363 c[2] - 435 c[3] + 29 c[4]
```

```
cert =
 Flatten[Array[c, 4] /. FindInstance[-285 c[1] + 1363 c[2] - 435 c[3] + 29 c[4] < 0 &&
      -9 c[1] + 47 c[2] - 15 c[3] + c[4] ≥ 0 &&
      -c[1] + 47 c[2] - 15 c[3] + c[4] ≥ 0 && 7 c[1] + 47 c[2] - 15 c[3] + c[4] ≥ 0 &&
      15 c[1] + 47 c[2] - 15 c[3] + c[4] ≥ 0, Array[c, 4], Integers]]
```

```
{88, 0, 0, 846}
```

```
GCD[88, 0, 0, 846]
```

```
2
```

```
cert = cert / 2
```

```
{44, 0, 0, 423}
```

```
Reverse[cert]
```

```
{423, 0, 0, 44}
```

```
cert.g
```

```
-273
```

```
cert.Transpose[A]
```

```
{27, 379, 731, 1083}
```

```
In[•]:= infeasiblecertshortcut[(-11 + x) (-5 + x)^12 (-4 + x) (5 + x)^15,
 feasibleinterlacingpolylist[(-11 + x) (-5 + x)^12 (-4 + x) (5 + x)^15]]
```

```
Out[•]= {423, 0, 0, 44}
```

```
chi = (-7 + x)^4 (-5 + x)^8 (5 + x)^15 (4 - 7 x + x^2)
```

$$(-7+x)^4\,(-5+x)^8\,(5+x)^{15}\,\left(4-7\,x+x^2\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-105, -34, 56, -14, 1}, {-89, -34, 56, -14, 1}, {7, -50, 56, -14, 1},
 {-49, -42, 56, -14, 1}, {-33, -42, 56, -14, 1}, {-145, -26, 56, -14, 1}}
```

```
A = {{7, -50, 56, -14, 1}, {-49, -42, 56, -14, 1}, {-33, -42, 56, -14, 1},
    {-105, -34, 56, -14, 1}, {-89, -34, 56, -14, 1}, {-145, -26, 56, -14, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 7 & -50 & 56 & -14 & 1 \\ -49 & -42 & 56 & -14 & 1 \\ -33 & -42 & 56 & -14 & 1 \\ -105 & -34 & 56 & -14 & 1 \\ -89 & -34 & 56 & -14 & 1 \\ -145 & -26 & 56 & -14 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{-645, -1274, 1624, -406, 29}
```

```
Array[c, 5].Transpose[A]
```

```
{7 c[1] - 50 c[2] + 56 c[3] - 14 c[4] + c[5],
 -49 c[1] - 42 c[2] + 56 c[3] - 14 c[4] + c[5], -33 c[1] - 42 c[2] + 56 c[3] - 14 c[4] + c[5],
 -105 c[1] - 34 c[2] + 56 c[3] - 14 c[4] + c[5],
 -89 c[1] - 34 c[2] + 56 c[3] - 14 c[4] + c[5],
 -145 c[1] - 26 c[2] + 56 c[3] - 14 c[4] + c[5]}
```

```
Array[c, 5].g
```

```
-645 c[1] - 1274 c[2] + 1624 c[3] - 406 c[4] + 29 c[5]
```

```
cert = Flatten[Array[c, 5] /.
    FindInstance[-645 c[1] - 1274 c[2] + 1624 c[3] - 406 c[4] + 29 c[5] < 0 &&
      7 c[1] - 50 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0 &&
      -49 c[1] - 42 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0 &&
      -33 c[1] - 42 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0 &&
      -105 c[1] - 34 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0 &&
      -89 c[1] - 34 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0 &&
      -145 c[1] - 26 c[2] + 56 c[3] - 14 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{-126, -631, 0, 0, -30576}
```

```
GCD[-126, -631, 0, 0, -30576]
```

```
1
```

```
Reverse[cert]
```

```
{-30576, 0, 0, -631, -126}
```

```
cert.g
```

```
-1540
```

```
cert.Transpose[A]
```

```
{92, 2100, 84, 4108, 2092, 4100}
```

```
In[•]:= infeasiblecertshortcut[(-7 + x)^4 (-5 + x)^8 (5 + x)^15 (4 - 7 x + x^2),
 feasibleinterlacingpolylist[(-7 + x)^4 (-5 + x)^8 (5 + x)^15 (4 - 7 x + x^2)]]
```

```
Out[•]= {-30 576, 0, 0, -631, -126}
```

```
chi = (-7 + x)^6 (-5 + x)^4 (-4 + x) (-3 + x)^3 (5 + x)^15
```

```
(-7 + x)^6 (-5 + x)^4 (-4 + x) (-3 + x)^3 (5 + x)^15
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{15, -98, 64, -14, 1}}
```

```
A = {{15, -98, 64, -14, 1}};
```

```
A // MatrixForm
```

```
( 15  -98  64  -14  1 )
```

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{195, -2826, 1856, -406, 29}
```

```
Array[c, 5].Transpose[A]
```

```
{15 c[1] - 98 c[2] + 64 c[3] - 14 c[4] + c[5]}
```

```
Array[c, 5].g
```

```
195 c[1] - 2826 c[2] + 1856 c[3] - 406 c[4] + 29 c[5]
```

```
cert = Flatten[
  Array[c, 5] /. FindInstance[195 c[1] - 2826 c[2] + 1856 c[3] - 406 c[4] + 29 c[5] < 0 &&
      15 c[1] - 98 c[2] + 64 c[3] - 14 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{0, -342, 0, 0, -33 465}
```

```
GCD[0, -342, 0, 0, -33 465]
```

```
3
```

```
cert = cert / 3
```

```
{0, -114, 0, 0, -11 155}
```

```
Reverse[cert]
```

```
{-11 155, 0, 0, -114, 0}
```

```
cert.g
```

```
-1331
```

```
cert.Transpose[A]
```

```
{17}
```

```
chi = (-8 + x) (-7 + x)^4 (-5 + x)^6 (-3 + x)^3 (5 + x)^15
```

```
(-8 + x) (-7 + x)^4 (-5 + x)^6 (-3 + x)^3 (5 + x)^15
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-105, -174, 104, -18, 1}, {63, -198, 104, -18, 1}, {-9, -190, 104, -18, 1},
 {7, -190, 104, -18, 1}, {-65, -182, 104, -18, 1}, {-49, -182, 104, -18, 1}}
```

```
A = {{63, -198, 104, -18, 1}, {-9, -190, 104, -18, 1}, {7, -190, 104, -18, 1},
    {-65, -182, 104, -18, 1}, {-49, -182, 104, -18, 1}, {-105, -174, 104, -18, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 63 & -198 & 104 & -18 & 1 \\ -9 & -190 & 104 & -18 & 1 \\ 7 & -190 & 104 & -18 & 1 \\ -65 & -182 & 104 & -18 & 1 \\ -49 & -182 & 104 & -18 & 1 \\ -105 & -174 & 104 & -18 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{435, -5598, 3016, -522, 29}
```

```
Array[c, 5].Transpose[A]
```

```
{63 c[1] - 198 c[2] + 104 c[3] - 18 c[4] + c[5],
 -9 c[1] - 190 c[2] + 104 c[3] - 18 c[4] + c[5],
 7 c[1] - 190 c[2] + 104 c[3] - 18 c[4] + c[5],
 -65 c[1] - 182 c[2] + 104 c[3] - 18 c[4] + c[5],
 -49 c[1] - 182 c[2] + 104 c[3] - 18 c[4] + c[5],
 -105 c[1] - 174 c[2] + 104 c[3] - 18 c[4] + c[5]}
```

```
Array[c, 5].g
```

```
435 c[1] - 5598 c[2] + 3016 c[3] - 522 c[4] + 29 c[5]
```

```
cert = Flatten[
  Array[c, 5] /. FindInstance[435 c[1] - 5598 c[2] + 3016 c[3] - 522 c[4] + 29 c[5] < 0 &&
     63 c[1] - 198 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -9 c[1] - 190 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0 &&
     7 c[1] - 190 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -65 c[1] - 182 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -49 c[1] - 182 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -105 c[1] - 174 c[2] + 104 c[3] - 18 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{102, 916, 0, 0, 175136}
```

```
GCD[102, 916, 0, 0, 175136]
```

```
2
```

```
cert = cert / 2
```

```
{51, 458, 0, 0, 87568}
```

```
Reverse[cert]
```

```
{87568, 0, 0, 458, 51}
```

```
cert.g
```

```
-2227
```

```
cert.Transpose[A]
```

```
{97, 89, 905, 897, 1713, 2521}
```

```
chi = (-5 + x)^11 (5 + x)^15 (-188 + 119 x - 20 x^2 + x^3)
```

$$(-5+x)^{11}\,(5+x)^{15}\,\left(-188+119\,x-20\,x^2+x^3\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-315, -172, 122, -20, 1}, {-299, -172, 122, -20, 1},
 {37, -220, 122, -20, 1}, {53, -220, 122, -20, 1}, {-51, -212, 122, -20, 1},
 {-35, -212, 122, -20, 1}, {-19, -212, 122, -20, 1}, {-3, -212, 122, -20, 1},
 {-123, -204, 122, -20, 1}, {-107, -204, 122, -20, 1}, {-91, -204, 122, -20, 1},
 {-75, -204, 122, -20, 1}, {-59, -204, 122, -20, 1}, {-195, -196, 122, -20, 1},
 {-179, -196, 122, -20, 1}, {-163, -196, 122, -20, 1}, {-147, -196, 122, -20, 1},
 {-131, -196, 122, -20, 1}, {-115, -196, 122, -20, 1}, {-235, -188, 122, -20, 1},
 {-219, -188, 122, -20, 1}, {-203, -188, 122, -20, 1}, {-187, -188, 122, -20, 1},
 {-275, -180, 122, -20, 1}, {-259, -180, 122, -20, 1}, {-243, -180, 122, -20, 1}}
```

```
A = {{37, -220, 122, -20, 1}, {53, -220, 122, -20, 1}, {-51, -212, 122, -20, 1},
    {-35, -212, 122, -20, 1}, {-19, -212, 122, -20, 1}, {-3, -212, 122, -20, 1},
    {-123, -204, 122, -20, 1}, {-107, -204, 122, -20, 1}, {-91, -204, 122, -20, 1},
    {-75, -204, 122, -20, 1}, {-59, -204, 122, -20, 1}, {-195, -196, 122, -20, 1},
    {-179, -196, 122, -20, 1}, {-163, -196, 122, -20, 1}, {-147, -196, 122, -20, 1},
    {-131, -196, 122, -20, 1}, {-115, -196, 122, -20, 1}, {-235, -188, 122, -20, 1},
    {-219, -188, 122, -20, 1}, {-203, -188, 122, -20, 1}, {-187, -188, 122, -20, 1},
    {-275, -180, 122, -20, 1}, {-259, -180, 122, -20, 1}, {-243, -180, 122, -20, 1},
    {-315, -172, 122, -20, 1}, {-299, -172, 122, -20, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 37 & -220 & 122 & -20 & 1 \\ 53 & -220 & 122 & -20 & 1 \\ -51 & -212 & 122 & -20 & 1 \\ -35 & -212 & 122 & -20 & 1 \\ -19 & -212 & 122 & -20 & 1 \\ -3 & -212 & 122 & -20 & 1 \\ -123 & -204 & 122 & -20 & 1 \\ -107 & -204 & 122 & -20 & 1 \\ -91 & -204 & 122 & -20 & 1 \\ -75 & -204 & 122 & -20 & 1 \\ -59 & -204 & 122 & -20 & 1 \\ -195 & -196 & 122 & -20 & 1 \\ -179 & -196 & 122 & -20 & 1 \\ -163 & -196 & 122 & -20 & 1 \\ -147 & -196 & 122 & -20 & 1 \\ -131 & -196 & 122 & -20 & 1 \\ -115 & -196 & 122 & -20 & 1 \\ -235 & -188 & 122 & -20 & 1 \\ -219 & -188 & 122 & -20 & 1 \\ -203 & -188 & 122 & -20 & 1 \\ -187 & -188 & 122 & -20 & 1 \\ -275 & -180 & 122 & -20 & 1 \\ -259 & -180 & 122 & -20 & 1 \\ -243 & -180 & 122 & -20 & 1 \\ -315 & -172 & 122 & -20 & 1 \\ -299 & -172 & 122 & -20 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{785, -6268, 3538, -580, 29}
```

```
Array[c, 5].Transpose[A]
```

```
{37 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5],
 53 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5],
 -51 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5],
 -35 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5],
 -19 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5],
 -3 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5],
 -123 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5],
 -107 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5],
 -91 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5],
 -75 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5],
 -59 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5],
 -195 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -179 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -163 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -147 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -131 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -115 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5],
 -235 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5],
 -219 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5],
 -203 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5],
 -187 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5],
 -275 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5],
 -259 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5],
 -243 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5],
 -315 c[1] - 172 c[2] + 122 c[3] - 20 c[4] + c[5],
 -299 c[1] - 172 c[2] + 122 c[3] - 20 c[4] + c[5]}
```

```
Array[c, 5].g
```

```
785 c[1] - 6268 c[2] + 3538 c[3] - 580 c[4] + 29 c[5]
```

```
cert = Flatten[
  Array[c, 5] /. FindInstance[785 c[1] - 6268 c[2] + 3538 c[3] - 580 c[4] + 29 c[5] < 0 &&
      37 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      53 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -51 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -35 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -19 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -3 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -123 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -107 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -91 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -75 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -59 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -195 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -179 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -163 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -147 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -131 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -115 c[1] - 196 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -235 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -219 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -203 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -187 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -275 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -259 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -243 c[1] - 180 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -315 c[1] - 172 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -299 c[1] - 172 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{-366, -2563, 0, 0, -544 242}
```

```
GCD[-366, -2563, 0, 0, -544 242]
```

```
1
```

```
Reverse[cert]
```

```
{-544 242, 0, 0, -2563, -366}
```

```
cert.g
```

```
-5444
```

```
cert.Transpose[A]
```

```
{6076, 220, 17 780, 11 924, 6068, 212, 23 628, 17 772,
 11 916, 6060, 204, 29 476, 23 620, 17 764, 11 908, 6052, 196,
 23 612, 17 756, 11 900, 6044, 17 748, 11 892, 6036, 11 884, 6028}
```

```
chi = (-7 + x) (-5 + x)^10 (-3 + x) (5 + x)^15 (48 - 15 x + x^2)
```

```
(-7 + x) (-5 + x)^10 (-3 + x) (5 + x)^15 (48 - 15 x + x^2)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-345, 1249, -846, 222, -25, 1}, {15, 1137, -838, 222, -25, 1},
 {-65, 1153, -838, 222, -25, 1}, {-145, 1169, -838, 222, -25, 1},
 {-225, 1185, -838, 222, -25, 1}, {-273, 1201, -838, 222, -25, 1},
 {295, 1041, -830, 222, -25, 1}, {215, 1057, -830, 222, -25, 1},
 {135, 1073, -830, 222, -25, 1}, {55, 1089, -830, 222, -25, 1},
 {-25, 1105, -830, 222, -25, 1}, {-105, 1121, -830, 222, -25, 1},
 {495, 961, -822, 222, -25, 1}, {415, 977, -822, 222, -25, 1},
 {335, 993, -822, 222, -25, 1}, {255, 1009, -822, 222, -25, 1},
 {175, 1025, -822, 222, -25, 1}, {695, 881, -814, 222, -25, 1},
 {615, 897, -814, 222, -25, 1}, {535, 913, -814, 222, -25, 1},
 {455, 929, -814, 222, -25, 1}, {895, 801, -806, 222, -25, 1},
 {815, 817, -806, 222, -25, 1}, {735, 833, -806, 222, -25, 1},
 {1095, 721, -798, 222, -25, 1}, {1015, 737, -798, 222, -25, 1}}
```

```
A = {{-345, 1249, -846, 222, -25, 1}, {15, 1137, -838, 222, -25, 1},
    {-65, 1153, -838, 222, -25, 1}, {-145, 1169, -838, 222, -25, 1},
    {-225, 1185, -838, 222, -25, 1}, {-273, 1201, -838, 222, -25, 1},
    {295, 1041, -830, 222, -25, 1}, {215, 1057, -830, 222, -25, 1},
    {135, 1073, -830, 222, -25, 1}, {55, 1089, -830, 222, -25, 1},
    {-25, 1105, -830, 222, -25, 1}, {-105, 1121, -830, 222, -25, 1},
    {495, 961, -822, 222, -25, 1}, {415, 977, -822, 222, -25, 1},
    {335, 993, -822, 222, -25, 1}, {255, 1009, -822, 222, -25, 1},
    {175, 1025, -822, 222, -25, 1}, {695, 881, -814, 222, -25, 1},
    {615, 897, -814, 222, -25, 1}, {535, 913, -814, 222, -25, 1},
    {455, 929, -814, 222, -25, 1}, {895, 801, -806, 222, -25, 1},
    {815, 817, -806, 222, -25, 1}, {735, 833, -806, 222, -25, 1},
    {1095, 721, -798, 222, -25, 1}, {1015, 737, -798, 222, -25, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -345 & 1249 & -846 & 222 & -25 & 1 \\ 15 & 1137 & -838 & 222 & -25 & 1 \\ -65 & 1153 & -838 & 222 & -25 & 1 \\ -145 & 1169 & -838 & 222 & -25 & 1 \\ -225 & 1185 & -838 & 222 & -25 & 1 \\ -273 & 1201 & -838 & 222 & -25 & 1 \\ 295 & 1041 & -830 & 222 & -25 & 1 \\ 215 & 1057 & -830 & 222 & -25 & 1 \\ 135 & 1073 & -830 & 222 & -25 & 1 \\ 55 & 1089 & -830 & 222 & -25 & 1 \\ -25 & 1105 & -830 & 222 & -25 & 1 \\ -105 & 1121 & -830 & 222 & -25 & 1 \\ 495 & 961 & -822 & 222 & -25 & 1 \\ 415 & 977 & -822 & 222 & -25 & 1 \\ 335 & 993 & -822 & 222 & -25 & 1 \\ 255 & 1009 & -822 & 222 & -25 & 1 \\ 175 & 1025 & -822 & 222 & -25 & 1 \\ 695 & 881 & -814 & 222 & -25 & 1 \\ 615 & 897 & -814 & 222 & -25 & 1 \\ 535 & 913 & -814 & 222 & -25 & 1 \\ 455 & 929 & -814 & 222 & -25 & 1 \\ 895 & 801 & -806 & 222 & -25 & 1 \\ 815 & 817 & -806 & 222 & -25 & 1 \\ 735 & 833 & -806 & 222 & -25 & 1 \\ 1095 & 721 & -798 & 222 & -25 & 1 \\ 1015 & 737 & -798 & 222 & -25 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-5325, 34\,125, -24\,270, 6438, -725, 29\}$$

```
Array[c, 6].Transpose[A]
```

$$\{-345\,c[1]+1249\,c[2]-846\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$15\,c[1]+1137\,c[2]-838\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-65\,c[1]+1153\,c[2]-838\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-145\,c[1]+1169\,c[2]-838\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-225\,c[1]+1185\,c[2]-838\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-273\,c[1]+1201\,c[2]-838\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$295\,c[1]+1041\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$215\,c[1]+1057\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$135\,c[1]+1073\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$55\,c[1]+1089\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-25\,c[1]+1105\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$-105\,c[1]+1121\,c[2]-830\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$495\,c[1]+961\,c[2]-822\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$415\,c[1]+977\,c[2]-822\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$335\,c[1]+993\,c[2]-822\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$255\,c[1]+1009\,c[2]-822\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$175\,c[1]+1025\,c[2]-822\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$695\,c[1]+881\,c[2]-814\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$615\,c[1]+897\,c[2]-814\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$535\,c[1]+913\,c[2]-814\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$455\,c[1]+929\,c[2]-814\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$895\,c[1]+801\,c[2]-806\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$815\,c[1]+817\,c[2]-806\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$735\,c[1]+833\,c[2]-806\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$1095\,c[1]+721\,c[2]-798\,c[3]+222\,c[4]-25\,c[5]+c[6],$$
$$1015\,c[1]+737\,c[2]-798\,c[3]+222\,c[4]-25\,c[5]+c[6]\}$$

```
Array[c, 6].g
```

$$-5325\,c[1]+34\,125\,c[2]-24\,270\,c[3]+6438\,c[4]-725\,c[5]+29\,c[6]$$

```
cert = Flatten[Array[c, 6] /. FindInstance[
     -5325 c[1] + 34 125 c[2] - 24 270 c[3] + 6438 c[4] - 725 c[5] + 29 c[6] < 0 &&
      -345 c[1] + 1249 c[2] - 846 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      15 c[1] + 1137 c[2] - 838 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -65 c[1] + 1153 c[2] - 838 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -145 c[1] + 1169 c[2] - 838 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -225 c[1] + 1185 c[2] - 838 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -273 c[1] + 1201 c[2] - 838 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      295 c[1] + 1041 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      215 c[1] + 1057 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      135 c[1] + 1073 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      55 c[1] + 1089 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -25 c[1] + 1105 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -105 c[1] + 1121 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      495 c[1] + 961 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      415 c[1] + 977 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      335 c[1] + 993 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      255 c[1] + 1009 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      175 c[1] + 1025 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      695 c[1] + 881 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      615 c[1] + 897 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      535 c[1] + 913 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      455 c[1] + 929 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      895 c[1] + 801 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      815 c[1] + 817 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      735 c[1] + 833 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1095 c[1] + 721 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 && 1015 c[1] +
        737 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{-2820, -12 969, -59 189, 0, 0, -34 793 172}
```

```
GCD[-2820, -12 969, -59 189, 0, 0, -34 793 172]
```

```
1
```

```
Reverse[cert]
```

```
{-34 793 172, 0, 0, -59 189, -12 969, -2820}
```

```
cert.g
```

```
-35 583
```

```
cert.Transpose[A]
```

```
{55 341, 19 157, 37 253, 55 349, 73 445, 1301, 1069, 19 165,
 37 261, 55 357, 73 453, 91 549, 1077, 19 173, 37 269, 55 365, 73 461,
 1085, 19 181, 37 277, 55 373, 1093, 19 189, 37 285, 1101, 19 197}
```

```
chi = (-7 + x)^3 (-5 + x)^8 (-3 + x) (5 + x)^15 (20 - 11 x + x^2)
```

```
(-7 + x)^3 (-5 + x)^8 (-3 + x) (5 + x)^15 (20 - 11 x + x^2)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{735, 133, -426, 154, -21, 1}, {-9, 501, -466, 154, -21, 1},
 {-57, 517, -466, 154, -21, 1}, {-105, 533, -466, 154, -21, 1},
 {207, 405, -458, 154, -21, 1}, {127, 421, -458, 154, -21, 1},
 {159, 421, -458, 154, -21, 1}, {79, 437, -458, 154, -21, 1},
 {111, 437, -458, 154, -21, 1}, {31, 453, -458, 154, -21, 1},
 {63, 453, -458, 154, -21, 1}, {375, 325, -450, 154, -21, 1},
 {295, 341, -450, 154, -21, 1}, {327, 341, -450, 154, -21, 1},
 {215, 357, -450, 154, -21, 1}, {247, 357, -450, 154, -21, 1},
 {279, 357, -450, 154, -21, 1}, {199, 373, -450, 154, -21, 1},
 {231, 373, -450, 154, -21, 1}, {495, 261, -442, 154, -21, 1},
 {415, 277, -442, 154, -21, 1}, {447, 277, -442, 154, -21, 1},
 {335, 293, -442, 154, -21, 1}, {367, 293, -442, 154, -21, 1},
 {399, 293, -442, 154, -21, 1}, {287, 309, -442, 154, -21, 1},
 {615, 197, -434, 154, -21, 1}, {535, 213, -434, 154, -21, 1},
 {567, 213, -434, 154, -21, 1}, {455, 229, -434, 154, -21, 1}}
```

```
A = {{-9, 501, -466, 154, -21, 1}, {-57, 517, -466, 154, -21, 1},
    {-105, 533, -466, 154, -21, 1}, {207, 405, -458, 154, -21, 1},
    {127, 421, -458, 154, -21, 1}, {159, 421, -458, 154, -21, 1},
    {79, 437, -458, 154, -21, 1}, {111, 437, -458, 154, -21, 1},
    {31, 453, -458, 154, -21, 1}, {63, 453, -458, 154, -21, 1},
    {375, 325, -450, 154, -21, 1}, {295, 341, -450, 154, -21, 1},
    {327, 341, -450, 154, -21, 1}, {215, 357, -450, 154, -21, 1},
    {247, 357, -450, 154, -21, 1}, {279, 357, -450, 154, -21, 1},
    {199, 373, -450, 154, -21, 1}, {231, 373, -450, 154, -21, 1},
    {495, 261, -442, 154, -21, 1}, {415, 277, -442, 154, -21, 1},
    {447, 277, -442, 154, -21, 1}, {335, 293, -442, 154, -21, 1},
    {367, 293, -442, 154, -21, 1}, {399, 293, -442, 154, -21, 1},
    {287, 309, -442, 154, -21, 1}, {615, 197, -434, 154, -21, 1},
    {535, 213, -434, 154, -21, 1}, {567, 213, -434, 154, -21, 1},
    {455, 229, -434, 154, -21, 1}, {735, 133, -426, 154, -21, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -9 & 501 & -466 & 154 & -21 & 1 \\ -57 & 517 & -466 & 154 & -21 & 1 \\ -105 & 533 & -466 & 154 & -21 & 1 \\ 207 & 405 & -458 & 154 & -21 & 1 \\ 127 & 421 & -458 & 154 & -21 & 1 \\ 159 & 421 & -458 & 154 & -21 & 1 \\ 79 & 437 & -458 & 154 & -21 & 1 \\ 111 & 437 & -458 & 154 & -21 & 1 \\ 31 & 453 & -458 & 154 & -21 & 1 \\ 63 & 453 & -458 & 154 & -21 & 1 \\ 375 & 325 & -450 & 154 & -21 & 1 \\ 295 & 341 & -450 & 154 & -21 & 1 \\ 327 & 341 & -450 & 154 & -21 & 1 \\ 215 & 357 & -450 & 154 & -21 & 1 \\ 247 & 357 & -450 & 154 & -21 & 1 \\ 279 & 357 & -450 & 154 & -21 & 1 \\ 199 & 373 & -450 & 154 & -21 & 1 \\ 231 & 373 & -450 & 154 & -21 & 1 \\ 495 & 261 & -442 & 154 & -21 & 1 \\ 415 & 277 & -442 & 154 & -21 & 1 \\ 447 & 277 & -442 & 154 & -21 & 1 \\ 335 & 293 & -442 & 154 & -21 & 1 \\ 367 & 293 & -442 & 154 & -21 & 1 \\ 399 & 293 & -442 & 154 & -21 & 1 \\ 287 & 309 & -442 & 154 & -21 & 1 \\ 615 & 197 & -434 & 154 & -21 & 1 \\ 535 & 213 & -434 & 154 & -21 & 1 \\ 567 & 213 & -434 & 154 & -21 & 1 \\ 455 & 229 & -434 & 154 & -21 & 1 \\ 735 & 133 & -426 & 154 & -21 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-925, 14\,545, -13\,474, 4466, -609, 29\}$$

```
Array[c, 6].Transpose[A]
```

```
{-9 c[1] + 501 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6],
 -57 c[1] + 517 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6],
 -105 c[1] + 533 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6],
 207 c[1] + 405 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 127 c[1] + 421 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 159 c[1] + 421 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 79 c[1] + 437 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 111 c[1] + 437 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 31 c[1] + 453 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 63 c[1] + 453 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6],
 375 c[1] + 325 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 295 c[1] + 341 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 327 c[1] + 341 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 215 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 247 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 279 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 199 c[1] + 373 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 231 c[1] + 373 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 495 c[1] + 261 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 415 c[1] + 277 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 447 c[1] + 277 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 335 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 367 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 399 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 287 c[1] + 309 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 615 c[1] + 197 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 535 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 567 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 455 c[1] + 229 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 735 c[1] + 133 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
-925 c[1] + 14 545 c[2] - 13 474 c[3] + 4466 c[4] - 609 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /. FindInstance[
    -925 c[1] + 14545 c[2] - 13474 c[3] + 4466 c[4] - 609 c[5] + 29 c[6] < 0 &&
     -9 c[1] + 501 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     -57 c[1] + 517 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     -105 c[1] + 533 c[2] - 466 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     207 c[1] + 405 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     127 c[1] + 421 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     159 c[1] + 421 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     79 c[1] + 437 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     111 c[1] + 437 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     31 c[1] + 453 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     63 c[1] + 453 c[2] - 458 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     375 c[1] + 325 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     295 c[1] + 341 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     327 c[1] + 341 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     215 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     247 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     279 c[1] + 357 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     199 c[1] + 373 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     231 c[1] + 373 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     495 c[1] + 261 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     415 c[1] + 277 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     447 c[1] + 277 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     335 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     367 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     399 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     287 c[1] + 309 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     615 c[1] + 197 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     535 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     567 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     455 c[1] + 229 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 && 735 c[1] +
       133 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{361, 1084, 4712, 0, 0, 1656424}
```

```
GCD[361, 1084, 4712, 0, 0, 1656424]
```

```
1
```

```
Reverse[cert]
```

```
{1656424, 0, 0, 4712, 1084, 361}
```

```
cert.g
```

```
-20337
```

```
cert.Transpose[A]
```

```
{467, 483, 499, 12075, 539, 12091, 555, 12107, 571, 12123, 23699,
 12163, 23715, 627, 12179, 23731, 12195, 23747, 35339, 23803, 35355,
 12267, 23819, 35371, 12283, 46979, 35443, 46995, 23907, 58619}
```

```
chi = (-7 + x)^4 (-5 + x)^7 (-3 + x) (5 + x)^15 (12 - 9 x + x^2)
```

$$(-7+x)^4\,(-5+x)^7\,(-3+x)\,(5+x)^{15}\left(12-9\,x+x^2\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{525, 65, -314, 126, -19, 1},
 {-11, 305, -338, 126, -19, 1}, {21, 305, -338, 126, -19, 1},
 {157, 225, -330, 126, -19, 1}, {189, 225, -330, 126, -19, 1},
 {77, 241, -330, 126, -19, 1}, {325, 145, -322, 126, -19, 1},
 {357, 145, -322, 126, -19, 1}, {245, 161, -322, 126, -19, 1}}
```

```
A = {{-11, 305, -338, 126, -19, 1},
    {21, 305, -338, 126, -19, 1}, {157, 225, -330, 126, -19, 1},
    {189, 225, -330, 126, -19, 1}, {77, 241, -330, 126, -19, 1},
    {325, 145, -322, 126, -19, 1}, {357, 145, -322, 126, -19, 1},
    {245, 161, -322, 126, -19, 1}, {525, 65, -314, 126, -19, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -11 & 305 & -338 & 126 & -19 & 1 \\ 21 & 305 & -338 & 126 & -19 & 1 \\ 157 & 225 & -330 & 126 & -19 & 1 \\ 189 & 225 & -330 & 126 & -19 & 1 \\ 77 & 241 & -330 & 126 & -19 & 1 \\ 325 & 145 & -322 & 126 & -19 & 1 \\ 357 & 145 & -322 & 126 & -19 & 1 \\ 245 & 161 & -322 & 126 & -19 & 1 \\ 525 & 65 & -314 & 126 & -19 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{345, 8829, -9810, 3654, -551, 29}
```

```
Array[c, 6].Transpose[A]
```

```
{-11 c[1] + 305 c[2] - 338 c[3] + 126 c[4] - 19 c[5] + c[6],
 21 c[1] + 305 c[2] - 338 c[3] + 126 c[4] - 19 c[5] + c[6],
 157 c[1] + 225 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6],
 189 c[1] + 225 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6],
 77 c[1] + 241 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6],
 325 c[1] + 145 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6],
 357 c[1] + 145 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6],
 245 c[1] + 161 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6],
 525 c[1] + 65 c[2] - 314 c[3] + 126 c[4] - 19 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
345 c[1] + 8829 c[2] - 9810 c[3] + 3654 c[4] - 551 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /.
    FindInstance[345 c[1] + 8829 c[2] - 9810 c[3] + 3654 c[4] - 551 c[5] + 29 c[6] < 0 &&
      -11 c[1] + 305 c[2] - 338 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      21 c[1] + 305 c[2] - 338 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      157 c[1] + 225 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      189 c[1] + 225 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      77 c[1] + 241 c[2] - 330 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      325 c[1] + 145 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      357 c[1] + 145 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 &&
      245 c[1] + 161 c[2] - 322 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0 && 525 c[1] +
        65 c[2] - 314 c[3] + 126 c[4] - 19 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{0, 0, 2913, 0, 0, 984 942}
```

```
GCD[0, 0, 2913, 0, 0, 984 942]
```

```
3
```

```
cert = cert / 3
```

```
{0, 0, 971, 0, 0, 328 314}
```

```
Reverse[cert]
```

```
{328 314, 0, 0, 971, 0, 0}
```

```
cert.g
```

```
-4404
```

```
cert.Transpose[A]
```

```
{116, 116, 7884, 7884, 7884, 15 652, 15 652, 15 652, 23 420}
```

```
chi = (-7 + x)^5 (-5 + x)^6 (-3 + x) (5 + x)^15 (8 - 7 x + x^2)
```

$$(-7+x)^5\,(-5+x)^6\,(-3+x)\,(5+x)^{15}\left(8-7x+x^2\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{15, 217, -254, 102, -17, 1}, {135, 153, -246, 102, -17, 1},
 {55, 169, -246, 102, -17, 1}, {255, 89, -238, 102, -17, 1}}
```

```
A = {{15, 217, -254, 102, -17, 1}, {135, 153, -246, 102, -17, 1},
    {55, 169, -246, 102, -17, 1}, {255, 89, -238, 102, -17, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 15 & 217 & -254 & 102 & -17 & 1 \\ 135 & 153 & -246 & 102 & -17 & 1 \\ 55 & 169 & -246 & 102 & -17 & 1 \\ 255 & 89 & -238 & 102 & -17 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{515, 5893, -7270, 2958, -493, 29}
```

```
Array[c, 6].Transpose[A]
```

```
{15 c[1] + 217 c[2] - 254 c[3] + 102 c[4] - 17 c[5] + c[6],
 135 c[1] + 153 c[2] - 246 c[3] + 102 c[4] - 17 c[5] + c[6],
 55 c[1] + 169 c[2] - 246 c[3] + 102 c[4] - 17 c[5] + c[6],
 255 c[1] + 89 c[2] - 238 c[3] + 102 c[4] - 17 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
515 c[1] + 5893 c[2] - 7270 c[3] + 2958 c[4] - 493 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /.
    FindInstance[515 c[1] + 5893 c[2] - 7270 c[3] + 2958 c[4] - 493 c[5] + 29 c[6] < 0 &&
      15 c[1] + 217 c[2] - 254 c[3] + 102 c[4] - 17 c[5] + c[6] ≥ 0 &&
      135 c[1] + 153 c[2] - 246 c[3] + 102 c[4] - 17 c[5] + c[6] ≥ 0 &&
      55 c[1] + 169 c[2] - 246 c[3] + 102 c[4] - 17 c[5] + c[6] ≥ 0 && 255 c[1] +
        89 c[2] - 238 c[3] + 102 c[4] - 17 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{76, 75, 67, 0, 0, 0}
```

```
GCD[76, 75, 67, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 67, 75, 76}
```

```
cert.g
```

```
-5975
```

```
cert.Transpose[A]
```

```
{397, 5253, 373, 10 109}
```

```
chi = (-9 + x) (-5 + x)^10 (5 + x)^15 (-92 + 75 x - 16 x^2 + x^3)
```

$$(-9+x)\,(-5+x)^{10}\,(5+x)^{15}\left(-92+75\,x-16\,x^2+x^3\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{1575, 545, -782, 222, -25, 1},
 {-369, 1121, -822, 222, -25, 1}, {135, 993, -814, 222, -25, 1},
 {-9, 1009, -814, 222, -25, 1}, {-121, 1025, -814, 222, -25, 1},
 {495, 881, -806, 222, -25, 1}, {351, 897, -806, 222, -25, 1},
 {383, 897, -806, 222, -25, 1}, {239, 913, -806, 222, -25, 1},
 {855, 769, -798, 222, -25, 1}, {711, 785, -798, 222, -25, 1},
 {743, 785, -798, 222, -25, 1}, {775, 785, -798, 222, -25, 1},
 {631, 801, -798, 222, -25, 1}, {1215, 657, -790, 222, -25, 1},
 {1103, 673, -790, 222, -25, 1}, {1135, 673, -790, 222, -25, 1},
 {1023, 689, -790, 222, -25, 1}, {1495, 561, -782, 222, -25, 1},
 {1383, 577, -782, 222, -25, 1}, {1855, 449, -774, 222, -25, 1},
 {1775, 465, -774, 222, -25, 1}, {2135, 353, -766, 222, -25, 1}}
```

```
A = {{-369, 1121, -822, 222, -25, 1},
   {135, 993, -814, 222, -25, 1}, {-9, 1009, -814, 222, -25, 1},
   {-121, 1025, -814, 222, -25, 1}, {495, 881, -806, 222, -25, 1},
   {351, 897, -806, 222, -25, 1}, {383, 897, -806, 222, -25, 1},
   {239, 913, -806, 222, -25, 1}, {855, 769, -798, 222, -25, 1},
   {711, 785, -798, 222, -25, 1}, {743, 785, -798, 222, -25, 1},
   {775, 785, -798, 222, -25, 1}, {631, 801, -798, 222, -25, 1},
   {1215, 657, -790, 222, -25, 1}, {1103, 673, -790, 222, -25, 1},
   {1135, 673, -790, 222, -25, 1}, {1023, 689, -790, 222, -25, 1},
   {1575, 545, -782, 222, -25, 1}, {1495, 561, -782, 222, -25, 1},
   {1383, 577, -782, 222, -25, 1}, {1855, 449, -774, 222, -25, 1},
   {1775, 465, -774, 222, -25, 1}, {2135, 353, -766, 222, -25, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -369 & 1121 & -822 & 222 & -25 & 1 \\ 135 & 993 & -814 & 222 & -25 & 1 \\ -9 & 1009 & -814 & 222 & -25 & 1 \\ -121 & 1025 & -814 & 222 & -25 & 1 \\ 495 & 881 & -806 & 222 & -25 & 1 \\ 351 & 897 & -806 & 222 & -25 & 1 \\ 383 & 897 & -806 & 222 & -25 & 1 \\ 239 & 913 & -806 & 222 & -25 & 1 \\ 855 & 769 & -798 & 222 & -25 & 1 \\ 711 & 785 & -798 & 222 & -25 & 1 \\ 743 & 785 & -798 & 222 & -25 & 1 \\ 775 & 785 & -798 & 222 & -25 & 1 \\ 631 & 801 & -798 & 222 & -25 & 1 \\ 1215 & 657 & -790 & 222 & -25 & 1 \\ 1103 & 673 & -790 & 222 & -25 & 1 \\ 1135 & 673 & -790 & 222 & -25 & 1 \\ 1023 & 689 & -790 & 222 & -25 & 1 \\ 1575 & 545 & -782 & 222 & -25 & 1 \\ 1495 & 561 & -782 & 222 & -25 & 1 \\ 1383 & 577 & -782 & 222 & -25 & 1 \\ 1855 & 449 & -774 & 222 & -25 & 1 \\ 1775 & 465 & -774 & 222 & -25 & 1 \\ 2135 & 353 & -766 & 222 & -25 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-1525, 28\,925, -23\,542, 6438, -725, 29\}$$

```
Array[c, 6].Transpose[A]
```

```
{-369 c[1] + 1121 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6],
 135 c[1] + 993 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 -9 c[1] + 1009 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 -121 c[1] + 1025 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 495 c[1] + 881 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 351 c[1] + 897 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 383 c[1] + 897 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 239 c[1] + 913 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 855 c[1] + 769 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 711 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 743 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 775 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 631 c[1] + 801 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 1215 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1103 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1135 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1023 c[1] + 689 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1575 c[1] + 545 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6],
 1495 c[1] + 561 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6],
 1383 c[1] + 577 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6],
 1855 c[1] + 449 c[2] - 774 c[3] + 222 c[4] - 25 c[5] + c[6],
 1775 c[1] + 465 c[2] - 774 c[3] + 222 c[4] - 25 c[5] + c[6],
 2135 c[1] + 353 c[2] - 766 c[3] + 222 c[4] - 25 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
-1525 c[1] + 28 925 c[2] - 23 542 c[3] + 6438 c[4] - 725 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /. FindInstance[
    -1525 c[1] + 28 925 c[2] - 23 542 c[3] + 6438 c[4] - 725 c[5] + 29 c[6] < 0 &&
     -369 c[1] + 1121 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     135 c[1] + 993 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -9 c[1] + 1009 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -121 c[1] + 1025 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     495 c[1] + 881 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     351 c[1] + 897 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     383 c[1] + 897 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     239 c[1] + 913 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     855 c[1] + 769 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     711 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     743 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     775 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     631 c[1] + 801 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1215 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1103 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1135 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1023 c[1] + 689 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1575 c[1] + 545 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1495 c[1] + 561 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1383 c[1] + 577 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1855 c[1] + 449 c[2] - 774 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
     1775 c[1] + 465 c[2] - 774 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 && 2135 c[1] +
       353 c[2] - 766 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
{112, 395, 479, 0, 0, 0}

GCD[112, 395, 479, 0, 0, 0]
1

Reverse[cert]
{0, 0, 0, 479, 395, 112}

cert.g
-22 043

cert.Transpose[A]
{7729, 17 449, 7641, 1417, 17 361, 7553, 11 137, 1329, 17 273, 7465, 11 049, 14 633,
 4825, 17 185, 10 961, 14 545, 8321, 17 097, 14 457, 8233, 14 369, 11 729, 11 641}
```

```
chi = (-7 + x)^2 (-5 + x)^9 (5 + x)^15 (-64 + 71 x - 16 x^2 + x^3)
```

$$(-7+x)^2\,(-5+x)^9\,(5+x)^{15}\left(-64+71\,x-16\,x^2+x^3\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{1085, 293, -582, 186, -23, 1}, {1053, 293, -582, 186, -23, 1},
 {-91, 629, -606, 186, -23, 1}, {1365, 197, -574, 186, -23, 1},
 {21, 613, -606, 186, -23, 1}, {525, 485, -598, 186, -23, 1},
 {381, 501, -598, 186, -23, 1}, {413, 501, -598, 186, -23, 1},
 {301, 517, -598, 186, -23, 1}, {189, 533, -598, 186, -23, 1},
 {885, 373, -590, 186, -23, 1}, {773, 389, -590, 186, -23, 1},
 {805, 389, -590, 186, -23, 1}, {693, 405, -590, 186, -23, 1},
 {581, 421, -590, 186, -23, 1}, {469, 437, -590, 186, -23, 1},
 {1165, 277, -582, 186, -23, 1}, {973, 309, -582, 186, -23, 1},
 {861, 325, -582, 186, -23, 1}, {1445, 181, -574, 186, -23, 1},
 {1253, 213, -574, 186, -23, 1}, {1725, 85, -566, 186, -23, 1},
 {1645, 101, -566, 186, -23, 1}, {1533, 117, -566, 186, -23, 1},
 {1925, 5, -558, 186, -23, 1}, {2205, -91, -550, 186, -23, 1}}
```

```
A = {{21, 613, -606, 186, -23, 1}, {-91, 629, -606, 186, -23, 1},
   {525, 485, -598, 186, -23, 1}, {381, 501, -598, 186, -23, 1},
   {413, 501, -598, 186, -23, 1}, {301, 517, -598, 186, -23, 1},
   {189, 533, -598, 186, -23, 1}, {885, 373, -590, 186, -23, 1},
   {773, 389, -590, 186, -23, 1}, {805, 389, -590, 186, -23, 1},
   {693, 405, -590, 186, -23, 1}, {581, 421, -590, 186, -23, 1},
   {469, 437, -590, 186, -23, 1}, {1165, 277, -582, 186, -23, 1},
   {1053, 293, -582, 186, -23, 1}, {1085, 293, -582, 186, -23, 1},
   {973, 309, -582, 186, -23, 1}, {861, 325, -582, 186, -23, 1},
   {1445, 181, -574, 186, -23, 1}, {1365, 197, -574, 186, -23, 1},
   {1253, 213, -574, 186, -23, 1}, {1725, 85, -566, 186, -23, 1},
   {1645, 101, -566, 186, -23, 1}, {1533, 117, -566, 186, -23, 1},
   {1925, 5, -558, 186, -23, 1}, {2205, -91, -550, 186, -23, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 21 & 613 & -606 & 186 & -23 & 1 \\ -91 & 629 & -606 & 186 & -23 & 1 \\ 525 & 485 & -598 & 186 & -23 & 1 \\ 381 & 501 & -598 & 186 & -23 & 1 \\ 413 & 501 & -598 & 186 & -23 & 1 \\ 301 & 517 & -598 & 186 & -23 & 1 \\ 189 & 533 & -598 & 186 & -23 & 1 \\ 885 & 373 & -590 & 186 & -23 & 1 \\ 773 & 389 & -590 & 186 & -23 & 1 \\ 805 & 389 & -590 & 186 & -23 & 1 \\ 693 & 405 & -590 & 186 & -23 & 1 \\ 581 & 421 & -590 & 186 & -23 & 1 \\ 469 & 437 & -590 & 186 & -23 & 1 \\ 1165 & 277 & -582 & 186 & -23 & 1 \\ 1053 & 293 & -582 & 186 & -23 & 1 \\ 1085 & 293 & -582 & 186 & -23 & 1 \\ 973 & 309 & -582 & 186 & -23 & 1 \\ 861 & 325 & -582 & 186 & -23 & 1 \\ 1445 & 181 & -574 & 186 & -23 & 1 \\ 1365 & 197 & -574 & 186 & -23 & 1 \\ 1253 & 213 & -574 & 186 & -23 & 1 \\ 1725 & 85 & -566 & 186 & -23 & 1 \\ 1645 & 101 & -566 & 186 & -23 & 1 \\ 1533 & 117 & -566 & 186 & -23 & 1 \\ 1925 & 5 & -558 & 186 & -23 & 1 \\ 2205 & -91 & -550 & 186 & -23 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{2185, 16 657, -17 454, 5394, -667, 29}
```

```
Array[c, 6].Transpose[A]
```

$$\{21\,c[1]+613\,c[2]-606\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$-91\,c[1]+629\,c[2]-606\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$525\,c[1]+485\,c[2]-598\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$381\,c[1]+501\,c[2]-598\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$413\,c[1]+501\,c[2]-598\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$301\,c[1]+517\,c[2]-598\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$189\,c[1]+533\,c[2]-598\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$885\,c[1]+373\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$773\,c[1]+389\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$805\,c[1]+389\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$693\,c[1]+405\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$581\,c[1]+421\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$469\,c[1]+437\,c[2]-590\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1165\,c[1]+277\,c[2]-582\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1053\,c[1]+293\,c[2]-582\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1085\,c[1]+293\,c[2]-582\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$973\,c[1]+309\,c[2]-582\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$861\,c[1]+325\,c[2]-582\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1445\,c[1]+181\,c[2]-574\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1365\,c[1]+197\,c[2]-574\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1253\,c[1]+213\,c[2]-574\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1725\,c[1]+85\,c[2]-566\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1645\,c[1]+101\,c[2]-566\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1533\,c[1]+117\,c[2]-566\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$1925\,c[1]+5\,c[2]-558\,c[3]+186\,c[4]-23\,c[5]+c[6],$$
$$2205\,c[1]-91\,c[2]-550\,c[3]+186\,c[4]-23\,c[5]+c[6]\}$$

```
Array[c, 6].g
```

$$2185\,c[1]+16\,657\,c[2]-17\,454\,c[3]+5394\,c[4]-667\,c[5]+29\,c[6]$$

```
cert = Flatten[Array[c, 6] /. FindInstance[
    2185 c[1] + 16 657 c[2] - 17 454 c[3] + 5394 c[4] - 667 c[5] + 29 c[6] < 0 &&
     21 c[1] + 613 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     -91 c[1] + 629 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     525 c[1] + 485 c[2] - 598 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     381 c[1] + 501 c[2] - 598 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     413 c[1] + 501 c[2] - 598 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     301 c[1] + 517 c[2] - 598 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     189 c[1] + 533 c[2] - 598 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     885 c[1] + 373 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     773 c[1] + 389 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     805 c[1] + 389 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     693 c[1] + 405 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     581 c[1] + 421 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     469 c[1] + 437 c[2] - 590 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1165 c[1] + 277 c[2] - 582 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1053 c[1] + 293 c[2] - 582 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1085 c[1] + 293 c[2] - 582 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     973 c[1] + 309 c[2] - 582 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     861 c[1] + 325 c[2] - 582 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1445 c[1] + 181 c[2] - 574 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1365 c[1] + 197 c[2] - 574 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1253 c[1] + 213 c[2] - 574 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1725 c[1] + 85 c[2] - 566 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1645 c[1] + 101 c[2] - 566 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1533 c[1] + 117 c[2] - 566 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
     1925 c[1] + 5 c[2] - 558 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 && 2205 c[1] -
       91 c[2] - 550 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{184, 1105, 6816, 0, 0, 3 452 532}
```

```
GCD[184, 1105, 6816, 0, 0, 3 452 532]
```

```
1
```

```
Reverse[cert]
```

```
{3 452 532, 0, 0, 6816, 1105, 184}
```

```
cert.g
```

```
-35 011
```

```
cert.Transpose[A]
```

```
{3265, 337, 9089, 273, 6161, 3233, 305, 6097, 3169, 9057, 6129, 3201, 273, 6065,
 3137, 9025, 6097, 3169, 6033, 8993, 6065, 6001, 8961, 6033, 8929, 8897}
```

```
chi = (-7 + x)^3 (-5 + x)^8 (5 + x)^15 (-44 + 53 x - 14 x^2 + x^3)
```

$$(-7+x)^3\,(-5+x)^8\,(5+x)^{15}\left(-44+53\,x-14\,x^2+x^3\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{735, 133, -426, 154, -21, 1},
 {695, 181, -434, 154, -21, 1}, {55, 389, -450, 154, -21, 1},
 {-25, 405, -450, 154, -21, 1}, {335, 293, -442, 154, -21, 1},
 {255, 309, -442, 154, -21, 1}, {175, 325, -442, 154, -21, 1},
 {615, 197, -434, 154, -21, 1}, {535, 213, -434, 154, -21, 1},
 {455, 229, -434, 154, -21, 1}, {975, 85, -426, 154, -21, 1},
 {895, 101, -426, 154, -21, 1}, {815, 117, -426, 154, -21, 1},
 {1175, 5, -418, 154, -21, 1}, {1095, 21, -418, 154, -21, 1},
 {1015, 37, -418, 154, -21, 1}, {1295, -59, -410, 154, -21, 1}}
```

```
A = {{55, 389, -450, 154, -21, 1},
    {-25, 405, -450, 154, -21, 1}, {335, 293, -442, 154, -21, 1},
    {255, 309, -442, 154, -21, 1}, {175, 325, -442, 154, -21, 1},
    {695, 181, -434, 154, -21, 1}, {615, 197, -434, 154, -21, 1},
    {535, 213, -434, 154, -21, 1}, {455, 229, -434, 154, -21, 1},
    {975, 85, -426, 154, -21, 1}, {895, 101, -426, 154, -21, 1},
    {815, 117, -426, 154, -21, 1}, {735, 133, -426, 154, -21, 1},
    {1175, 5, -418, 154, -21, 1}, {1095, 21, -418, 154, -21, 1},
    {1015, 37, -418, 154, -21, 1}, {1295, -59, -410, 154, -21, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
55 & 389 & -450 & 154 & -21 & 1 \\
-25 & 405 & -450 & 154 & -21 & 1 \\
335 & 293 & -442 & 154 & -21 & 1 \\
255 & 309 & -442 & 154 & -21 & 1 \\
175 & 325 & -442 & 154 & -21 & 1 \\
695 & 181 & -434 & 154 & -21 & 1 \\
615 & 197 & -434 & 154 & -21 & 1 \\
535 & 213 & -434 & 154 & -21 & 1 \\
455 & 229 & -434 & 154 & -21 & 1 \\
975 & 85 & -426 & 154 & -21 & 1 \\
895 & 101 & -426 & 154 & -21 & 1 \\
815 & 117 & -426 & 154 & -21 & 1 \\
735 & 133 & -426 & 154 & -21 & 1 \\
1175 & 5 & -418 & 154 & -21 & 1 \\
1095 & 21 & -418 & 154 & -21 & 1 \\
1015 & 37 & -418 & 154 & -21 & 1 \\
1295 & -59 & -410 & 154 & -21 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{1795, 11 409, -13 058, 4466, -609, 29}
```

```
Array[c, 6].Transpose[A]
```

```
{55 c[1] + 389 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 -25 c[1] + 405 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6],
 335 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 255 c[1] + 309 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 175 c[1] + 325 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6],
 695 c[1] + 181 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 615 c[1] + 197 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 535 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 455 c[1] + 229 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6],
 975 c[1] + 85 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6],
 895 c[1] + 101 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6],
 815 c[1] + 117 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6],
 735 c[1] + 133 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6],
 1175 c[1] + 5 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6],
 1095 c[1] + 21 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6],
 1015 c[1] + 37 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6],
 1295 c[1] - 59 c[2] - 410 c[3] + 154 c[4] - 21 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
1795 c[1] + 11 409 c[2] - 13 058 c[3] + 4466 c[4] - 609 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /. FindInstance[
    1795 c[1] + 11 409 c[2] - 13 058 c[3] + 4466 c[4] - 609 c[5] + 29 c[6] < 0 &&
     55 c[1] + 389 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     -25 c[1] + 405 c[2] - 450 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     335 c[1] + 293 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     255 c[1] + 309 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     175 c[1] + 325 c[2] - 442 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     695 c[1] + 181 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     615 c[1] + 197 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     535 c[1] + 213 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     455 c[1] + 229 c[2] - 434 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     975 c[1] + 85 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     895 c[1] + 101 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     815 c[1] + 117 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     735 c[1] + 133 c[2] - 426 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     1175 c[1] + 5 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     1095 c[1] + 21 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 &&
     1015 c[1] + 37 c[2] - 418 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0 && 1295 c[1] -
       59 c[2] - 410 c[3] + 154 c[4] - 21 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{-52, -173, -157, 0, 0, 0}
```

```
GCD[-52, -173, -157, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, -157, -173, -52}
```

```
cert.g
```

```
-16 991
```

```
cert.Transpose[A]
```

```
{493, 1885, 1285, 2677, 4069, 685, 2077, 3469,
 4861, 1477, 2869, 4261, 5653, 3661, 5053, 6445, 7237}
```

```
chi = (-8 + x) (-5 + x)^8 (-3 + x) (5 + x)^15 (31 - 12 x + x^2)^2
```

$$(-8+x)\,(-5+x)^{8}\,(-3+x)\,(5+x)^{15}\left(31-12\,x+x^{2}\right)^{2}$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-279, 945, -674, 190, -23, 1},
 {-31, 849, -666, 190, -23, 1}, {217, 753, -658, 190, -23, 1},
 {105, 769, -658, 190, -23, 1}, {465, 657, -650, 190, -23, 1}}
```

```
A = {{-279, 945, -674, 190, -23, 1},
    {-31, 849, -666, 190, -23, 1}, {217, 753, -658, 190, -23, 1},
    {105, 769, -658, 190, -23, 1}, {465, 657, -650, 190, -23, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -279 & 945 & -674 & 190 & -23 & 1 \\ -31 & 849 & -666 & 190 & -23 & 1 \\ 217 & 753 & -658 & 190 & -23 & 1 \\ 105 & 769 & -658 & 190 & -23 & 1 \\ 465 & 657 & -650 & 190 & -23 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{-3115, 25 277, -19 354, 5510, -667, 29}
```

```
Array[c, 6].Transpose[A]
```

```
{-279 c[1] + 945 c[2] - 674 c[3] + 190 c[4] - 23 c[5] + c[6],
 -31 c[1] + 849 c[2] - 666 c[3] + 190 c[4] - 23 c[5] + c[6],
 217 c[1] + 753 c[2] - 658 c[3] + 190 c[4] - 23 c[5] + c[6],
 105 c[1] + 769 c[2] - 658 c[3] + 190 c[4] - 23 c[5] + c[6],
 465 c[1] + 657 c[2] - 650 c[3] + 190 c[4] - 23 c[5] + c[6]}
```

```
Array[c, 6].g
```

$$-3115\,c[1]+25\,277\,c[2]-19\,354\,c[3]+5510\,c[4]-667\,c[5]+29\,c[6]$$

```
cert = Flatten[Array[c, 6] /. FindInstance[
    -3115 c[1] + 25 277 c[2] - 19 354 c[3] + 5510 c[4] - 667 c[5] + 29 c[6] < 0 &&
     -279 c[1] + 945 c[2] - 674 c[3] + 190 c[4] - 23 c[5] + c[6] ≥ 0 &&
     -31 c[1] + 849 c[2] - 666 c[3] + 190 c[4] - 23 c[5] + c[6] ≥ 0 &&
     217 c[1] + 753 c[2] - 658 c[3] + 190 c[4] - 23 c[5] + c[6] ≥ 0 &&
     105 c[1] + 769 c[2] - 658 c[3] + 190 c[4] - 23 c[5] + c[6] ≥ 0 && 465 c[1] +
       657 c[2] - 650 c[3] + 190 c[4] - 23 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

$$\{-217,-1528,-11\,608,0,0,-6\,439\,670\}$$

```
GCD[-217, -1528, -11 608, 0, 0, -6 439 670]
```

$$1$$

```
Reverse[cert]
```

$$\{-6\,439\,670,0,0,-11\,608,-1528,-217\}$$

```
cert.g
```

$$-36\,499$$

```
cert.Transpose[A]
```

$$\{705,713,721,577,729\}$$

```
chi = (-5 + x)^10 (5 + x)^15 (928 - 779 x + 219 x^2 - 25 x^3 + x^4)
```

$$(-5+x)^{10}\,(5+x)^{15}\,\left(928-779\,x+219\,x^2-25\,x^3+x^4\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

$$\{\{-145,1089,-822,222,-25,1\},$$
$$\{295,961,-814,222,-25,1\},\{215,977,-814,222,-25,1\},$$
$$\{135,993,-814,222,-25,1\},\{655,849,-806,222,-25,1\},$$
$$\{575,865,-806,222,-25,1\},\{495,881,-806,222,-25,1\},$$
$$\{1015,737,-798,222,-25,1\},\{935,753,-798,222,-25,1\},$$
$$\{855,769,-798,222,-25,1\},\{775,785,-798,222,-25,1\},$$
$$\{1295,641,-790,222,-25,1\},\{1215,657,-790,222,-25,1\},$$
$$\{1135,673,-790,222,-25,1\},\{1495,561,-782,222,-25,1\}\}$$

```
A = {{-145, 1089, -822, 222, -25, 1},
    {295, 961, -814, 222, -25, 1}, {215, 977, -814, 222, -25, 1},
    {135, 993, -814, 222, -25, 1}, {655, 849, -806, 222, -25, 1},
    {575, 865, -806, 222, -25, 1}, {495, 881, -806, 222, -25, 1},
    {1015, 737, -798, 222, -25, 1}, {935, 753, -798, 222, -25, 1},
    {855, 769, -798, 222, -25, 1}, {775, 785, -798, 222, -25, 1},
    {1295, 641, -790, 222, -25, 1}, {1215, 657, -790, 222, -25, 1},
    {1135, 673, -790, 222, -25, 1}, {1495, 561, -782, 222, -25, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -145 & 1089 & -822 & 222 & -25 & 1 \\ 295 & 961 & -814 & 222 & -25 & 1 \\ 215 & 977 & -814 & 222 & -25 & 1 \\ 135 & 993 & -814 & 222 & -25 & 1 \\ 655 & 849 & -806 & 222 & -25 & 1 \\ 575 & 865 & -806 & 222 & -25 & 1 \\ 495 & 881 & -806 & 222 & -25 & 1 \\ 1015 & 737 & -798 & 222 & -25 & 1 \\ 935 & 753 & -798 & 222 & -25 & 1 \\ 855 & 769 & -798 & 222 & -25 & 1 \\ 775 & 785 & -798 & 222 & -25 & 1 \\ 1295 & 641 & -790 & 222 & -25 & 1 \\ 1215 & 657 & -790 & 222 & -25 & 1 \\ 1135 & 673 & -790 & 222 & -25 & 1 \\ 1495 & 561 & -782 & 222 & -25 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{-3725, 31725, -23854, 6438, -725, 29}
```

```
Array[c, 6].Transpose[A]
```

```
{-145 c[1] + 1089 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6],
 295 c[1] + 961 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 215 c[1] + 977 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 135 c[1] + 993 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 655 c[1] + 849 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 575 c[1] + 865 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 495 c[1] + 881 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 1015 c[1] + 737 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 935 c[1] + 753 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 855 c[1] + 769 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 775 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 1295 c[1] + 641 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1215 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1135 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1495 c[1] + 561 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6]}
```

```
Array[c, 6].g
```

```
-3725 c[1] + 31725 c[2] - 23854 c[3] + 6438 c[4] - 725 c[5] + 29 c[6]
```

```
cert = Flatten[Array[c, 6] /. FindInstance[
    -3725 c[1] + 31 725 c[2] - 23 854 c[3] + 6438 c[4] - 725 c[5] + 29 c[6] < 0 &&
     -145 c[1] + 1089 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      295 c[1] + 961 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      215 c[1] + 977 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      135 c[1] + 993 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      655 c[1] + 849 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      575 c[1] + 865 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      495 c[1] + 881 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1015 c[1] + 737 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      935 c[1] + 753 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      855 c[1] + 769 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      775 c[1] + 785 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1295 c[1] + 641 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1215 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1135 c[1] + 673 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1495 c[1] + 561 c[2] - 782 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0,
    Array[c, 6], Integers]]
```

```
{-71, -265, -339, 0, 0, 0}
```

```
GCD[-71, -265, -339, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, -339, -265, -71}
```

```
cert.g
```

```
-56 144
```

```
cert.Transpose[A]
```

```
{368, 336, 1776, 3216, 1744, 3184, 4624,
 3152, 4592, 6032, 7472, 6000, 7440, 8880, 10 288}
```

```
chi = (-7 + x) (-5 + x)^9 (-4 + x) (5 + x)^15 (-169 + 107 x - 19 x^2 + x^3)
```

$$(-7+x)\,(-5+x)^{9}\,(-4+x)\,(5+x)^{15}\left(-169+107\,x-19\,x^{2}+x^{3}\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{461, -5710, 5271, -1940, 347, -30, 1}, {525, -5710, 5271, -1940, 347, -30, 1},
 {861, -5870, 5287, -1940, 347, -30, 1}, {-35, -5518, 5255, -1940, 347, -30, 1},
 {845, -5774, 5271, -1940, 347, -30, 1}, {685, -5742, 5271, -1940, 347, -30, 1},
 {1021, -5902, 5287, -1940, 347, -30, 1}, {-1675, -4630, 5103, -1932, 347, -30, 1},
 {-1115, -4822, 5119, -1932, 347, -30, 1},
 {-1275, -4790, 5119, -1932, 347, -30, 1},
 {-715, -4982, 5135, -1932, 347, -30, 1}, {-875, -4950, 5135, -1932, 347, -30, 1},
 {-155, -5174, 5151, -1932, 347, -30, 1}, {-379, -5142, 5151, -1932, 347, -30, 1},
 {-315, -5142, 5151, -1932, 347, -30, 1}, {245, -5334, 5167, -1932, 347, -30, 1},
 {21, -5302, 5167, -1932, 347, -30, 1}, {-2675, -4030, 4983, -1924, 347, -30, 1},
 {-2115, -4222, 4999, -1924, 347, -30, 1},
 {-2275, -4190, 4999, -1924, 347, -30, 1},
 {-1555, -4414, 5015, -1924, 347, -30, 1},
 {-1715, -4382, 5015, -1924, 347, -30, 1},
 {-1155, -4574, 5031, -1924, 347, -30, 1},
 {-1379, -4542, 5031, -1924, 347, -30, 1}, {-595, -4766, 5047, -1924, 347, -30, 1},
 {-819, -4734, 5047, -1924, 347, -30, 1}, {-3515, -3462, 4863, -1916, 347, -30, 1},
 {-2955, -3654, 4879, -1916, 347, -30, 1},
 {-3115, -3622, 4879, -1916, 347, -30, 1},
 {-2555, -3814, 4895, -1916, 347, -30, 1},
 {-1995, -4006, 4911, -1916, 347, -30, 1},
 {-1435, -4198, 4927, -1916, 347, -30, 1},
 {-4915, -2702, 4727, -1908, 347, -30, 1},
 {-4515, -2862, 4743, -1908, 347, -30, 1},
 {-3955, -3054, 4759, -1908, 347, -30, 1},
 {-3395, -3246, 4775, -1908, 347, -30, 1},
 {-5355, -2294, 4623, -1900, 347, -30, 1},
 {-6755, -1534, 4487, -1892, 347, -30, 1}}
```

```
A = {{-35, -5518, 5255, -1940, 347, -30, 1},
    {845, -5774, 5271, -1940, 347, -30, 1}, {685, -5742, 5271, -1940, 347, -30, 1},
    {461, -5710, 5271, -1940, 347, -30, 1}, {525, -5710, 5271, -1940, 347, -30, 1},
    {1021, -5902, 5287, -1940, 347, -30, 1}, {861, -5870, 5287, -1940, 347, -30, 1},
    {-1675, -4630, 5103, -1932, 347, -30, 1},
    {-1115, -4822, 5119, -1932, 347, -30, 1}, {-1275, -4790, 5119,
     -1932, 347, -30, 1}, {-715, -4982, 5135, -1932, 347, -30, 1},
    {-875, -4950, 5135, -1932, 347, -30, 1}, {-155, -5174, 5151,
     -1932, 347, -30, 1}, {-379, -5142, 5151, -1932, 347, -30, 1},
    {-315, -5142, 5151, -1932, 347, -30, 1}, {245, -5334, 5167, -1932, 347, -30, 1},
    {21, -5302, 5167, -1932, 347, -30, 1}, {-2675, -4030, 4983, -1924, 347, -30, 1},
    {-2115, -4222, 4999, -1924, 347, -30, 1},
    {-2275, -4190, 4999, -1924, 347, -30, 1},
    {-1555, -4414, 5015, -1924, 347, -30, 1}, {-1715, -4382, 5015,
     -1924, 347, -30, 1}, {-1155, -4574, 5031, -1924, 347, -30, 1},
    {-1379, -4542, 5031, -1924, 347, -30, 1}, {-595, -4766, 5047,
     -1924, 347, -30, 1}, {-819, -4734, 5047, -1924, 347, -30, 1},
    {-3515, -3462, 4863, -1916, 347, -30, 1}, {-2955, -3654, 4879,
     -1916, 347, -30, 1}, {-3115, -3622, 4879, -1916, 347, -30, 1},
    {-2555, -3814, 4895, -1916, 347, -30, 1}, {-1995, -4006, 4911,
     -1916, 347, -30, 1}, {-1435, -4198, 4927, -1916, 347, -30, 1},
    {-4915, -2702, 4727, -1908, 347, -30, 1}, {-4515, -2862, 4743,
     -1908, 347, -30, 1}, {-3955, -3054, 4759, -1908, 347, -30, 1},
    {-3395, -3246, 4775, -1908, 347, -30, 1}, {-5355, -2294, 4623,
     -1900, 347, -30, 1}, {-6755, -1534, 4487, -1892, 347, -30, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
-35 & -5518 & 5255 & -1940 & 347 & -30 & 1 \\
845 & -5774 & 5271 & -1940 & 347 & -30 & 1 \\
685 & -5742 & 5271 & -1940 & 347 & -30 & 1 \\
461 & -5710 & 5271 & -1940 & 347 & -30 & 1 \\
525 & -5710 & 5271 & -1940 & 347 & -30 & 1 \\
1021 & -5902 & 5287 & -1940 & 347 & -30 & 1 \\
861 & -5870 & 5287 & -1940 & 347 & -30 & 1 \\
-1675 & -4630 & 5103 & -1932 & 347 & -30 & 1 \\
-1115 & -4822 & 5119 & -1932 & 347 & -30 & 1 \\
-1275 & -4790 & 5119 & -1932 & 347 & -30 & 1 \\
-715 & -4982 & 5135 & -1932 & 347 & -30 & 1 \\
-875 & -4950 & 5135 & -1932 & 347 & -30 & 1 \\
-155 & -5174 & 5151 & -1932 & 347 & -30 & 1 \\
-379 & -5142 & 5151 & -1932 & 347 & -30 & 1 \\
-315 & -5142 & 5151 & -1932 & 347 & -30 & 1 \\
245 & -5334 & 5167 & -1932 & 347 & -30 & 1 \\
21 & -5302 & 5167 & -1932 & 347 & -30 & 1 \\
-2675 & -4030 & 4983 & -1924 & 347 & -30 & 1 \\
-2115 & -4222 & 4999 & -1924 & 347 & -30 & 1 \\
-2275 & -4190 & 4999 & -1924 & 347 & -30 & 1 \\
-1555 & -4414 & 5015 & -1924 & 347 & -30 & 1 \\
-1715 & -4382 & 5015 & -1924 & 347 & -30 & 1 \\
-1155 & -4574 & 5031 & -1924 & 347 & -30 & 1 \\
-1379 & -4542 & 5031 & -1924 & 347 & -30 & 1 \\
-595 & -4766 & 5047 & -1924 & 347 & -30 & 1 \\
-819 & -4734 & 5047 & -1924 & 347 & -30 & 1 \\
-3515 & -3462 & 4863 & -1916 & 347 & -30 & 1 \\
-2955 & -3654 & 4879 & -1916 & 347 & -30 & 1 \\
-3115 & -3622 & 4879 & -1916 & 347 & -30 & 1 \\
-2555 & -3814 & 4895 & -1916 & 347 & -30 & 1 \\
-1995 & -4006 & 4911 & -1916 & 347 & -30 & 1 \\
-1435 & -4198 & 4927 & -1916 & 347 & -30 & 1 \\
-4915 & -2702 & 4727 & -1908 & 347 & -30 & 1 \\
-4515 & -2862 & 4743 & -1908 & 347 & -30 & 1 \\
-3955 & -3054 & 4759 & -1908 & 347 & -30 & 1 \\
-3395 & -3246 & 4775 & -1908 & 347 & -30 & 1 \\
-5355 & -2294 & 4623 & -1900 & 347 & -30 & 1 \\
-6755 & -1534 & 4487 & -1892 & 347 & -30 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{20\,585, -165\,318, 151\,915, -56\,148, 10\,063, -870, 29\}$$

```
Array[c, 7].Transpose[A]
```

$$\begin{aligned}
&\{-35\,c[1]-5518\,c[2]+5255\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 845\,c[1]-5774\,c[2]+5271\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 685\,c[1]-5742\,c[2]+5271\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 461\,c[1]-5710\,c[2]+5271\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 525\,c[1]-5710\,c[2]+5271\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 1021\,c[1]-5902\,c[2]+5287\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 861\,c[1]-5870\,c[2]+5287\,c[3]-1940\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1675\,c[1]-4630\,c[2]+5103\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1115\,c[1]-4822\,c[2]+5119\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1275\,c[1]-4790\,c[2]+5119\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-715\,c[1]-4982\,c[2]+5135\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-875\,c[1]-4950\,c[2]+5135\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-155\,c[1]-5174\,c[2]+5151\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-379\,c[1]-5142\,c[2]+5151\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-315\,c[1]-5142\,c[2]+5151\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 245\,c[1]-5334\,c[2]+5167\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&\ 21\,c[1]-5302\,c[2]+5167\,c[3]-1932\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-2675\,c[1]-4030\,c[2]+4983\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-2115\,c[1]-4222\,c[2]+4999\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-2275\,c[1]-4190\,c[2]+4999\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1555\,c[1]-4414\,c[2]+5015\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1715\,c[1]-4382\,c[2]+5015\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1155\,c[1]-4574\,c[2]+5031\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1379\,c[1]-4542\,c[2]+5031\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-595\,c[1]-4766\,c[2]+5047\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-819\,c[1]-4734\,c[2]+5047\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-3515\,c[1]-3462\,c[2]+4863\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-2955\,c[1]-3654\,c[2]+4879\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-3115\,c[1]-3622\,c[2]+4879\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-2555\,c[1]-3814\,c[2]+4895\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1995\,c[1]-4006\,c[2]+4911\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-1435\,c[1]-4198\,c[2]+4927\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-4915\,c[1]-2702\,c[2]+4727\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-4515\,c[1]-2862\,c[2]+4743\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-3955\,c[1]-3054\,c[2]+4759\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-3395\,c[1]-3246\,c[2]+4775\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-5355\,c[1]-2294\,c[2]+4623\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],\\
&-6755\,c[1]-1534\,c[2]+4487\,c[3]-1892\,c[4]+347\,c[5]-30\,c[6]+c[7]\}
\end{aligned}$$

```
Array[c, 7].g
```

$$20\,585\,c[1]-165\,318\,c[2]+151\,915\,c[3]-56\,148\,c[4]+10\,063\,c[5]-870\,c[6]+29\,c[7]$$

```
cert = Flatten[
  Array[c, 7] /. FindInstance[20 585 c[1] - 165 318 c[2] + 151 915 c[3] - 56 148 c[4] +
       10 063 c[5] - 870 c[6] + 29 c[7] < 0 &&
     -35 c[1] - 5518 c[2] + 5255 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     845 c[1] - 5774 c[2] + 5271 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     685 c[1] - 5742 c[2] + 5271 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     461 c[1] - 5710 c[2] + 5271 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     525 c[1] - 5710 c[2] + 5271 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     1021 c[1] - 5902 c[2] + 5287 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     861 c[1] - 5870 c[2] + 5287 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1675 c[1] - 4630 c[2] + 5103 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1115 c[1] - 4822 c[2] + 5119 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1275 c[1] - 4790 c[2] + 5119 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -715 c[1] - 4982 c[2] + 5135 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -875 c[1] - 4950 c[2] + 5135 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -155 c[1] - 5174 c[2] + 5151 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -379 c[1] - 5142 c[2] + 5151 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -315 c[1] - 5142 c[2] + 5151 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     245 c[1] - 5334 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     21 c[1] - 5302 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2675 c[1] - 4030 c[2] + 4983 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2115 c[1] - 4222 c[2] + 4999 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2275 c[1] - 4190 c[2] + 4999 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1555 c[1] - 4414 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1715 c[1] - 4382 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1155 c[1] - 4574 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1379 c[1] - 4542 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -595 c[1] - 4766 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -819 c[1] - 4734 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3515 c[1] - 3462 c[2] + 4863 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2955 c[1] - 3654 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3115 c[1] - 3622 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2555 c[1] - 3814 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1995 c[1] - 4006 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1435 c[1] - 4198 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4915 c[1] - 2702 c[2] + 4727 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4515 c[1] - 2862 c[2] + 4743 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3955 c[1] - 3054 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3395 c[1] - 3246 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5355 c[1] - 2294 c[2] + 4623 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -6755 c[1] - 1534 c[2] + 4487 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
```

```
{0, 676, 3743, 8141, 0, 0, 0}
```

```
GCD[0, 676, 3743, 8141, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 8141, 3743, 676, 0}
```

```
cert.g
```

```
-237 991
```

```
cert.Transpose[A]
```

```
{145 757, 32 589, 54 221, 75 853, 75 853, 5949, 27 581, 242 237, 172 333, 193 965,
 124 061, 145 693, 54 157, 75 789, 75 789, 5885, 27 517, 263 805, 193 901, 215 533,
 123 997, 145 629, 75 725, 97 357, 5821, 27 453, 263 741, 193 837, 215 469,
 145 565, 75 661, 5757, 333 581, 285 309, 215 405, 145 501, 285 245, 355 085}
```

```
chi = (-9 + x) (-7 + x)^2 (-5 + x)^8 (-3 + x) (5 + x)^15 (16 - 9 x + x^2)
```

```
(-9 + x) (-7 + x)^2 (-5 + x)^8 (-3 + x) (5 + x)^15 (16 - 9 x + x^2)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-4305, -764, 3235, -1512, 301, -28, 1}, {567, -3924, 3867, -1552, 301, -28, 1},
 {903, -4084, 3883, -1552, 301, -28, 1}, {-945, -3036, 3715, -1544, 301, -28, 1},
 {-449, -3228, 3731, -1544, 301, -28, 1}, {-385, -3228, 3731, -1544, 301, -28, 1},
 {-609, -3196, 3731, -1544, 301, -28, 1}, {-273, -3356, 3747, -1544, 301, -28, 1},
 {63, -3516, 3763, -1544, 301, -28, 1}, {-1625, -2500, 3595, -1536, 301, -28, 1},
 {-1785, -2468, 3595, -1536, 301, -28, 1},
 {-1225, -2660, 3611, -1536, 301, -28, 1},
 {-1449, -2628, 3611, -1536, 301, -28, 1},
 {-889, -2820, 3627, -1536, 301, -28, 1}, {-1113, -2788, 3627, -1536, 301, -28, 1},
 {-2465, -1932, 3475, -1528, 301, -28, 1},
 {-2625, -1900, 3475, -1528, 301, -28, 1},
 {-2065, -2092, 3491, -1528, 301, -28, 1},
 {-2289, -2060, 3491, -1528, 301, -28, 1},
 {-1729, -2252, 3507, -1528, 301, -28, 1},
 {-1953, -2220, 3507, -1528, 301, -28, 1},
 {-3465, -1332, 3355, -1520, 301, -28, 1},
 {-2905, -1524, 3371, -1520, 301, -28, 1},
 {-3129, -1492, 3371, -1520, 301, -28, 1}, {-3745, -956, 3251, -1512, 301, -28, 1}}
```

```
A = {{567, -3924, 3867, -1552, 301, -28, 1},
   {903, -4084, 3883, -1552, 301, -28, 1}, {-945, -3036, 3715, -1544, 301, -28, 1},
   {-449, -3228, 3731, -1544, 301, -28, 1}, {-385, -3228, 3731,
    -1544, 301, -28, 1}, {-609, -3196, 3731, -1544, 301, -28, 1},
   {-273, -3356, 3747, -1544, 301, -28, 1}, {63, -3516, 3763, -1544, 301, -28, 1},
   {-1625, -2500, 3595, -1536, 301, -28, 1},
   {-1785, -2468, 3595, -1536, 301, -28, 1},
   {-1225, -2660, 3611, -1536, 301, -28, 1}, {-1449, -2628, 3611,
    -1536, 301, -28, 1}, {-889, -2820, 3627, -1536, 301, -28, 1},
   {-1113, -2788, 3627, -1536, 301, -28, 1}, {-2465, -1932, 3475,
    -1528, 301, -28, 1}, {-2625, -1900, 3475, -1528, 301, -28, 1},
   {-2065, -2092, 3491, -1528, 301, -28, 1}, {-2289, -2060, 3491,
    -1528, 301, -28, 1}, {-1729, -2252, 3507, -1528, 301, -28, 1},
   {-1953, -2220, 3507, -1528, 301, -28, 1}, {-3465, -1332, 3355,
    -1520, 301, -28, 1}, {-2905, -1524, 3371, -1520, 301, -28, 1},
   {-3129, -1492, 3371, -1520, 301, -28, 1}, {-4305, -764, 3235,
    -1512, 301, -28, 1}, {-3745, -956, 3251, -1512, 301, -28, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 567 & -3924 & 3867 & -1552 & 301 & -28 & 1 \\ 903 & -4084 & 3883 & -1552 & 301 & -28 & 1 \\ -945 & -3036 & 3715 & -1544 & 301 & -28 & 1 \\ -449 & -3228 & 3731 & -1544 & 301 & -28 & 1 \\ -385 & -3228 & 3731 & -1544 & 301 & -28 & 1 \\ -609 & -3196 & 3731 & -1544 & 301 & -28 & 1 \\ -273 & -3356 & 3747 & -1544 & 301 & -28 & 1 \\ 63 & -3516 & 3763 & -1544 & 301 & -28 & 1 \\ -1625 & -2500 & 3595 & -1536 & 301 & -28 & 1 \\ -1785 & -2468 & 3595 & -1536 & 301 & -28 & 1 \\ -1225 & -2660 & 3611 & -1536 & 301 & -28 & 1 \\ -1449 & -2628 & 3611 & -1536 & 301 & -28 & 1 \\ -889 & -2820 & 3627 & -1536 & 301 & -28 & 1 \\ -1113 & -2788 & 3627 & -1536 & 301 & -28 & 1 \\ -2465 & -1932 & 3475 & -1528 & 301 & -28 & 1 \\ -2625 & -1900 & 3475 & -1528 & 301 & -28 & 1 \\ -2065 & -2092 & 3491 & -1528 & 301 & -28 & 1 \\ -2289 & -2060 & 3491 & -1528 & 301 & -28 & 1 \\ -1729 & -2252 & 3507 & -1528 & 301 & -28 & 1 \\ -1953 & -2220 & 3507 & -1528 & 301 & -28 & 1 \\ -3465 & -1332 & 3355 & -1520 & 301 & -28 & 1 \\ -2905 & -1524 & 3371 & -1520 & 301 & -28 & 1 \\ -3129 & -1492 & 3371 & -1520 & 301 & -28 & 1 \\ -4305 & -764 & 3235 & -1512 & 301 & -28 & 1 \\ -3745 & -956 & 3251 & -1512 & 301 & -28 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{8115, -105 772, 109 975, -44 840, 8729, -812, 29}
```

```
Array[c, 7].Transpose[A]
```

$$\{567\,c[1]-3924\,c[2]+3867\,c[3]-1552\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$903\,c[1]-4084\,c[2]+3883\,c[3]-1552\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-945\,c[1]-3036\,c[2]+3715\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-449\,c[1]-3228\,c[2]+3731\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-385\,c[1]-3228\,c[2]+3731\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-609\,c[1]-3196\,c[2]+3731\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-273\,c[1]-3356\,c[2]+3747\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$63\,c[1]-3516\,c[2]+3763\,c[3]-1544\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1625\,c[1]-2500\,c[2]+3595\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1785\,c[1]-2468\,c[2]+3595\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1225\,c[1]-2660\,c[2]+3611\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1449\,c[1]-2628\,c[2]+3611\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-889\,c[1]-2820\,c[2]+3627\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1113\,c[1]-2788\,c[2]+3627\,c[3]-1536\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-2465\,c[1]-1932\,c[2]+3475\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-2625\,c[1]-1900\,c[2]+3475\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-2065\,c[1]-2092\,c[2]+3491\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-2289\,c[1]-2060\,c[2]+3491\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1729\,c[1]-2252\,c[2]+3507\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-1953\,c[1]-2220\,c[2]+3507\,c[3]-1528\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-3465\,c[1]-1332\,c[2]+3355\,c[3]-1520\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-2905\,c[1]-1524\,c[2]+3371\,c[3]-1520\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-3129\,c[1]-1492\,c[2]+3371\,c[3]-1520\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-4305\,c[1]-764\,c[2]+3235\,c[3]-1512\,c[4]+301\,c[5]-28\,c[6]+c[7],$$
$$-3745\,c[1]-956\,c[2]+3251\,c[3]-1512\,c[4]+301\,c[5]-28\,c[6]+c[7]\}$$

```
Array[c, 7].g
```

$$8115\,c[1]-105\,772\,c[2]+109\,975\,c[3]-44\,840\,c[4]+8729\,c[5]-812\,c[6]+29\,c[7]$$

```
cert = Flatten[Array[c, 7] /. FindInstance[
    8115 c[1] - 105 772 c[2] + 109 975 c[3] - 44 840 c[4] + 8729 c[5] - 812 c[6] + 29 c[7] <
      0 && 567 c[1] - 3924 c[2] + 3867 c[3] - 1552 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     903 c[1] - 4084 c[2] + 3883 c[3] - 1552 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -945 c[1] - 3036 c[2] + 3715 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -449 c[1] - 3228 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -385 c[1] - 3228 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -609 c[1] - 3196 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -273 c[1] - 3356 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     63 c[1] - 3516 c[2] + 3763 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1625 c[1] - 2500 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1785 c[1] - 2468 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1225 c[1] - 2660 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1449 c[1] - 2628 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -889 c[1] - 2820 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1113 c[1] - 2788 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2465 c[1] - 1932 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2625 c[1] - 1900 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2065 c[1] - 2092 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2289 c[1] - 2060 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1729 c[1] - 2252 c[2] + 3507 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1953 c[1] - 2220 c[2] + 3507 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3465 c[1] - 1332 c[2] + 3355 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2905 c[1] - 1524 c[2] + 3371 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3129 c[1] - 1492 c[2] + 3371 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -4305 c[1] - 764 c[2] + 3235 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3745 c[1] - 956 c[2] + 3251 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
```

```
{-1018, 0, 8413, 20 451, 0, 0, 0}
```

```
GCD[-1018, 0, 8413, 20 451, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 20 451, 8413, 0, -1018}
```

```
cert.g
```

```
-64 235
```

```
cert.Transpose[A]
```

```
{215 913, 8473, 639 961, 269 641, 204 489, 432 521, 225 081, 17 641,
 486 249, 649 129, 213 657, 441 689, 6217, 234 249, 495 417, 658 297, 222 825,
 450 857, 15 385, 243 417, 667 465, 231 993, 460 025, 676 633, 241 161}
```

```
chi = (-7 + x)^2 (-5 + x)^6 (-4 + x) (-3 + x) (5 + x)^15 (31 - 12 x + x^2)^2
```

```
(-7 + x)^2 (-5 + x)^6 (-4 + x) (-3 + x) (5 + x)^15 (31 - 12 x + x^2)^2
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{465, -3218, 3175, -1300, 263, -26, 1}}
```

```
A = {{465, -3218, 3175, -1300, 263, -26, 1}};
```

```
A // MatrixForm
```

```
( 465  -3218  3175  -1300  263  -26  1 )
```

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{10 205, -91 114, 91 483, -37 636, 7627, -754, 29}
```

```
Array[c, 7].Transpose[A]
```

```
{465 c[1] - 3218 c[2] + 3175 c[3] - 1300 c[4] + 263 c[5] - 26 c[6] + c[7]}
```

```
Array[c, 7].g
```

```
10 205 c[1] - 91 114 c[2] + 91 483 c[3] - 37 636 c[4] + 7627 c[5] - 754 c[6] + 29 c[7]
```

```
cert = Flatten[
  Array[c, 7] /. FindInstance[10 205 c[1] - 91 114 c[2] + 91 483 c[3] - 37 636 c[4] +
       7627 c[5] - 754 c[6] + 29 c[7] < 0 && 465 c[1] - 3218 c[2] + 3175 c[3] -
       1300 c[4] + 263 c[5] - 26 c[6] + c[7] ≥ 0, Array[c, 7], Integers]]
```

```
{0, 0, 3, -3784, 0, 0, -4 921 960}
```

```
GCD[0, 0, 3, -3784, 0, 0, -4 921 960]
```

```
1
```

```
Reverse[cert]
```

```
{-4 921 960, 0, 0, -3784, 3, 0, 0}
```

```
cert.g
```

```
-47 767
```

```
cert.Transpose[A]
```

```
{6765}
```

```
chi = (-7 + x) (-5 + x)^9 (5 + x)^15 (596 - 581 x + 183 x^2 - 23 x^3 + x^4)
```

```
(-7 + x) (-5 + x)^9 (5 + x)^15 (596 - 581 x + 183 x^2 - 23 x^3 + x^4)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-7595, -966, 4367, -1884, 347, -30, 1},
 {301, -5118, 5079, -1924, 347, -30, 1}, {861, -5310, 5095, -1924, 347, -30, 1},
 {1197, -5470, 5111, -1924, 347, -30, 1}, {-1995, -4006, 4911, -1916, 347, -30, 1},
 {-1435, -4198, 4927, -1916, 347, -30, 1},
 {-1659, -4166, 4927, -1916, 347, -30, 1}, {-875, -4390, 4943, -1916, 347, -30, 1},
 {-1099, -4358, 4943, -1916, 347, -30, 1}, {-315, -4582, 4959, -1916, 347, -30, 1},
 {-539, -4550, 4959, -1916, 347, -30, 1}, {245, -4774, 4975, -1916, 347, -30, 1},
 {21, -4742, 4975, -1916, 347, -30, 1}, {-4515, -2862, 4743, -1908, 347, -30, 1},
 {-3955, -3054, 4759, -1908, 347, -30, 1},
 {-3395, -3246, 4775, -1908, 347, -30, 1},
 {-2835, -3438, 4791, -1908, 347, -30, 1},
 {-3059, -3406, 4791, -1908, 347, -30, 1},
 {-2275, -3630, 4807, -1908, 347, -30, 1},
 {-2499, -3598, 4807, -1908, 347, -30, 1},
 {-1715, -3822, 4823, -1908, 347, -30, 1},
 {-1939, -3790, 4823, -1908, 347, -30, 1},
 {-5915, -2102, 4607, -1900, 347, -30, 1},
 {-5355, -2294, 4623, -1900, 347, -30, 1},
 {-4795, -2486, 4639, -1900, 347, -30, 1},
 {-4235, -2678, 4655, -1900, 347, -30, 1},
 {-4459, -2646, 4655, -1900, 347, -30, 1},
 {-3675, -2870, 4671, -1900, 347, -30, 1},
 {-7315, -1342, 4471, -1892, 347, -30, 1},
 {-6755, -1534, 4487, -1892, 347, -30, 1},
 {-6195, -1726, 4503, -1892, 347, -30, 1},
 {-5635, -1918, 4519, -1892, 347, -30, 1},
 {-8715, -582, 4335, -1884, 347, -30, 1}, {-8155, -774, 4351, -1884, 347, -30, 1},
 {-10 115, 178, 4199, -1876, 347, -30, 1}, {-9555, -14, 4215, -1876, 347, -30, 1}}
```

```
A = {{301, -5118, 5079, -1924, 347, -30, 1},
    {861, -5310, 5095, -1924, 347, -30, 1}, {1197, -5470, 5111, -1924, 347, -30, 1},
    {-1995, -4006, 4911, -1916, 347, -30, 1}, {-1435, -4198, 4927,
     -1916, 347, -30, 1}, {-1659, -4166, 4927, -1916, 347, -30, 1},
    {-875, -4390, 4943, -1916, 347, -30, 1}, {-1099, -4358, 4943,
     -1916, 347, -30, 1}, {-315, -4582, 4959, -1916, 347, -30, 1},
    {-539, -4550, 4959, -1916, 347, -30, 1}, {245, -4774, 4975, -1916, 347, -30, 1},
    {21, -4742, 4975, -1916, 347, -30, 1}, {-4515, -2862, 4743, -1908, 347, -30, 1},
    {-3955, -3054, 4759, -1908, 347, -30, 1},
    {-3395, -3246, 4775, -1908, 347, -30, 1},
    {-2835, -3438, 4791, -1908, 347, -30, 1}, {-3059, -3406, 4791,
     -1908, 347, -30, 1}, {-2275, -3630, 4807, -1908, 347, -30, 1},
    {-2499, -3598, 4807, -1908, 347, -30, 1}, {-1715, -3822, 4823,
     -1908, 347, -30, 1}, {-1939, -3790, 4823, -1908, 347, -30, 1},
    {-5915, -2102, 4607, -1900, 347, -30, 1}, {-5355, -2294, 4623,
     -1900, 347, -30, 1}, {-4795, -2486, 4639, -1900, 347, -30, 1},
    {-4235, -2678, 4655, -1900, 347, -30, 1}, {-4459, -2646, 4655,
     -1900, 347, -30, 1}, {-3675, -2870, 4671, -1900, 347, -30, 1},
    {-7315, -1342, 4471, -1892, 347, -30, 1}, {-6755, -1534, 4487,
     -1892, 347, -30, 1}, {-6195, -1726, 4503, -1892, 347, -30, 1},
    {-5635, -1918, 4519, -1892, 347, -30, 1}, {-8715, -582, 4335,
     -1884, 347, -30, 1}, {-8155, -774, 4351, -1884, 347, -30, 1},
    {-7595, -966, 4367, -1884, 347, -30, 1}, {-10 115, 178, 4199,
     -1876, 347, -30, 1}, {-9555, -14, 4215, -1876, 347, -30, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
301 & -5118 & 5079 & -1924 & 347 & -30 & 1 \\
861 & -5310 & 5095 & -1924 & 347 & -30 & 1 \\
1197 & -5470 & 5111 & -1924 & 347 & -30 & 1 \\
-1995 & -4006 & 4911 & -1916 & 347 & -30 & 1 \\
-1435 & -4198 & 4927 & -1916 & 347 & -30 & 1 \\
-1659 & -4166 & 4927 & -1916 & 347 & -30 & 1 \\
-875 & -4390 & 4943 & -1916 & 347 & -30 & 1 \\
-1099 & -4358 & 4943 & -1916 & 347 & -30 & 1 \\
-315 & -4582 & 4959 & -1916 & 347 & -30 & 1 \\
-539 & -4550 & 4959 & -1916 & 347 & -30 & 1 \\
245 & -4774 & 4975 & -1916 & 347 & -30 & 1 \\
21 & -4742 & 4975 & -1916 & 347 & -30 & 1 \\
-4515 & -2862 & 4743 & -1908 & 347 & -30 & 1 \\
-3955 & -3054 & 4759 & -1908 & 347 & -30 & 1 \\
-3395 & -3246 & 4775 & -1908 & 347 & -30 & 1 \\
-2835 & -3438 & 4791 & -1908 & 347 & -30 & 1 \\
-3059 & -3406 & 4791 & -1908 & 347 & -30 & 1 \\
-2275 & -3630 & 4807 & -1908 & 347 & -30 & 1 \\
-2499 & -3598 & 4807 & -1908 & 347 & -30 & 1 \\
-1715 & -3822 & 4823 & -1908 & 347 & -30 & 1 \\
-1939 & -3790 & 4823 & -1908 & 347 & -30 & 1 \\
-5915 & -2102 & 4607 & -1900 & 347 & -30 & 1 \\
-5355 & -2294 & 4623 & -1900 & 347 & -30 & 1 \\
-4795 & -2486 & 4639 & -1900 & 347 & -30 & 1 \\
-4235 & -2678 & 4655 & -1900 & 347 & -30 & 1 \\
-4459 & -2646 & 4655 & -1900 & 347 & -30 & 1 \\
-3675 & -2870 & 4671 & -1900 & 347 & -30 & 1 \\
-7315 & -1342 & 4471 & -1892 & 347 & -30 & 1 \\
-6755 & -1534 & 4487 & -1892 & 347 & -30 & 1 \\
-6195 & -1726 & 4503 & -1892 & 347 & -30 & 1 \\
-5635 & -1918 & 4519 & -1892 & 347 & -30 & 1 \\
-8715 & -582 & 4335 & -1884 & 347 & -30 & 1 \\
-8155 & -774 & 4351 & -1884 & 347 & -30 & 1 \\
-7595 & -966 & 4367 & -1884 & 347 & -30 & 1 \\
-10\,115 & 178 & 4199 & -1876 & 347 & -30 & 1 \\
-9555 & -14 & 4215 & -1876 & 347 & -30 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{8585, -146\,918, 146\,635, -55\,732, 10\,063, -870, 29\}$$

```
Array[c, 7].Transpose[A]
```

$$\{301\,c[1]-5118\,c[2]+5079\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$861\,c[1]-5310\,c[2]+5095\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$1197\,c[1]-5470\,c[2]+5111\,c[3]-1924\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1995\,c[1]-4006\,c[2]+4911\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1435\,c[1]-4198\,c[2]+4927\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1659\,c[1]-4166\,c[2]+4927\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-875\,c[1]-4390\,c[2]+4943\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1099\,c[1]-4358\,c[2]+4943\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-315\,c[1]-4582\,c[2]+4959\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-539\,c[1]-4550\,c[2]+4959\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$245\,c[1]-4774\,c[2]+4975\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$21\,c[1]-4742\,c[2]+4975\,c[3]-1916\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-4515\,c[1]-2862\,c[2]+4743\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-3955\,c[1]-3054\,c[2]+4759\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-3395\,c[1]-3246\,c[2]+4775\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-2835\,c[1]-3438\,c[2]+4791\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-3059\,c[1]-3406\,c[2]+4791\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-2275\,c[1]-3630\,c[2]+4807\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-2499\,c[1]-3598\,c[2]+4807\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1715\,c[1]-3822\,c[2]+4823\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-1939\,c[1]-3790\,c[2]+4823\,c[3]-1908\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-5915\,c[1]-2102\,c[2]+4607\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-5355\,c[1]-2294\,c[2]+4623\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-4795\,c[1]-2486\,c[2]+4639\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-4235\,c[1]-2678\,c[2]+4655\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-4459\,c[1]-2646\,c[2]+4655\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-3675\,c[1]-2870\,c[2]+4671\,c[3]-1900\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-7315\,c[1]-1342\,c[2]+4471\,c[3]-1892\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-6755\,c[1]-1534\,c[2]+4487\,c[3]-1892\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-6195\,c[1]-1726\,c[2]+4503\,c[3]-1892\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-5635\,c[1]-1918\,c[2]+4519\,c[3]-1892\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-8715\,c[1]-582\,c[2]+4335\,c[3]-1884\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-8155\,c[1]-774\,c[2]+4351\,c[3]-1884\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-7595\,c[1]-966\,c[2]+4367\,c[3]-1884\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-10\,115\,c[1]+178\,c[2]+4199\,c[3]-1876\,c[4]+347\,c[5]-30\,c[6]+c[7],$$
$$-9555\,c[1]-14\,c[2]+4215\,c[3]-1876\,c[4]+347\,c[5]-30\,c[6]+c[7]\}$$

```
Array[c, 7].g
```

$$8585\,c[1]-146\,918\,c[2]+146\,635\,c[3]-55\,732\,c[4]+10\,063\,c[5]-870\,c[6]+29\,c[7]$$

```
cert = Flatten[
  Array[c, 7] /. FindInstance[8585 c[1] - 146 918 c[2] + 146 635 c[3] - 55 732 c[4] +
       10 063 c[5] - 870 c[6] + 29 c[7] < 0 &&
     301 c[1] - 5118 c[2] + 5079 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     861 c[1] - 5310 c[2] + 5095 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     1197 c[1] - 5470 c[2] + 5111 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1995 c[1] - 4006 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1435 c[1] - 4198 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1659 c[1] - 4166 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -875 c[1] - 4390 c[2] + 4943 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1099 c[1] - 4358 c[2] + 4943 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -315 c[1] - 4582 c[2] + 4959 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -539 c[1] - 4550 c[2] + 4959 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     245 c[1] - 4774 c[2] + 4975 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     21 c[1] - 4742 c[2] + 4975 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4515 c[1] - 2862 c[2] + 4743 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3955 c[1] - 3054 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3395 c[1] - 3246 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2835 c[1] - 3438 c[2] + 4791 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3059 c[1] - 3406 c[2] + 4791 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2275 c[1] - 3630 c[2] + 4807 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2499 c[1] - 3598 c[2] + 4807 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1715 c[1] - 3822 c[2] + 4823 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1939 c[1] - 3790 c[2] + 4823 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5915 c[1] - 2102 c[2] + 4607 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5355 c[1] - 2294 c[2] + 4623 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4795 c[1] - 2486 c[2] + 4639 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4235 c[1] - 2678 c[2] + 4655 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4459 c[1] - 2646 c[2] + 4655 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3675 c[1] - 2870 c[2] + 4671 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -7315 c[1] - 1342 c[2] + 4471 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -6755 c[1] - 1534 c[2] + 4487 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -6195 c[1] - 1726 c[2] + 4503 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5635 c[1] - 1918 c[2] + 4519 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -8715 c[1] - 582 c[2] + 4335 c[3] - 1884 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -8155 c[1] - 774 c[2] + 4351 c[3] - 1884 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -7595 c[1] - 966 c[2] + 4367 c[3] - 1884 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -10 115 c[1] + 178 c[2] + 4199 c[3] - 1876 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -9555 c[1] - 14 c[2] + 4215 c[3] - 1876 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
```

```
{-2015, -14 106, -98 738, -690 887, 0, 0, -899 357 723}
```

```
GCD[-2015, -14 106, -98 738, -690 887, 0, 0, -899 357 723]
```

```
1
```

```
Reverse[cert]
```

```
{-899 357 723, 0, 0, -690 887, -98 738, -14 106, -2015}
```

```
cert.g
```

```
-179 780
```

```
cert.Transpose[A]
```

```
{6556, 6700, 6812, 8012, 8156, 8124, 8300, 8268, 8444, 8412, 8588, 8556, 9436, 9580,
 9724, 9868, 9836, 10 012, 9980, 10 156, 10 124, 11 148, 11 292, 11 436, 11 580,
 11 548, 11 724, 12 860, 13 004, 13 148, 13 292, 14 572, 14 716, 14 860, 16 284, 16 428}
```

```
chi = (-7 + x) (-5 + x)^9 (5 + x)^15 (484 - 565 x + 183 x^2 - 23 x^3 + x^4)
```

```
(-7 + x) (-5 + x)^9 (5 + x)^15 (484 - 565 x + 183 x^2 - 23 x^3 + x^4)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-7595, -966, 4367, -1884, 347, -30, 1}, {-1155, -4014, 4839, -1908, 347, -30, 1},
 {-371, -4238, 4855, -1908, 347, -30, 1}, {-2891, -3094, 4687, -1900, 347, -30, 1},
 {-3115, -3062, 4687, -1900, 347, -30, 1},
 {-2331, -3286, 4703, -1900, 347, -30, 1},
 {-5635, -1918, 4519, -1892, 347, -30, 1},
 {-4851, -2142, 4535, -1892, 347, -30, 1},
 {-5075, -2110, 4535, -1892, 347, -30, 1},
 {-8155, -774, 4351, -1884, 347, -30, 1}, {-10 675, 370, 4183, -1876, 347, -30, 1},
 {-10 115, 178, 4199, -1876, 347, -30, 1}, {-9555, -14, 4215, -1876, 347, -30, 1},
 {-12 075, 1130, 4047, -1868, 347, -30, 1}, {-11 515, 938, 4063, -1868, 347, -30, 1}}
```

```
A = {{-1155, -4014, 4839, -1908, 347, -30, 1},
   {-371, -4238, 4855, -1908, 347, -30, 1},
   {-2891, -3094, 4687, -1900, 347, -30, 1}, {-3115, -3062, 4687, -1900,
    347, -30, 1}, {-2331, -3286, 4703, -1900, 347, -30, 1},
   {-5635, -1918, 4519, -1892, 347, -30, 1}, {-4851, -2142, 4535,
    -1892, 347, -30, 1}, {-5075, -2110, 4535, -1892, 347, -30, 1},
   {-8155, -774, 4351, -1884, 347, -30, 1}, {-7595, -966, 4367,
    -1884, 347, -30, 1}, {-10 675, 370, 4183, -1876, 347, -30, 1},
   {-10 115, 178, 4199, -1876, 347, -30, 1}, {-9555, -14, 4215, -1876, 347, -30, 1},
   {-12 075, 1130, 4047, -1868, 347, -30, 1},
   {-11 515, 938, 4063, -1868, 347, -30, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -1155 & -4014 & 4839 & -1908 & 347 & -30 & 1 \\ -371 & -4238 & 4855 & -1908 & 347 & -30 & 1 \\ -2891 & -3094 & 4687 & -1900 & 347 & -30 & 1 \\ -3115 & -3062 & 4687 & -1900 & 347 & -30 & 1 \\ -2331 & -3286 & 4703 & -1900 & 347 & -30 & 1 \\ -5635 & -1918 & 4519 & -1892 & 347 & -30 & 1 \\ -4851 & -2142 & 4535 & -1892 & 347 & -30 & 1 \\ -5075 & -2110 & 4535 & -1892 & 347 & -30 & 1 \\ -8155 & -774 & 4351 & -1884 & 347 & -30 & 1 \\ -7595 & -966 & 4367 & -1884 & 347 & -30 & 1 \\ -10\,675 & 370 & 4183 & -1876 & 347 & -30 & 1 \\ -10\,115 & 178 & 4199 & -1876 & 347 & -30 & 1 \\ -9555 & -14 & 4215 & -1876 & 347 & -30 & 1 \\ -12\,075 & 1130 & 4047 & -1868 & 347 & -30 & 1 \\ -11\,515 & 938 & 4063 & -1868 & 347 & -30 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-9335, -122\,182, 140\,555, -55\,316, 10\,063, -870, 29\}$$

```
Array[c, 7].Transpose[A]
```

$$\begin{aligned}
&\{-1155\,c[1] - 4014\,c[2] + 4839\,c[3] - 1908\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -371\,c[1] - 4238\,c[2] + 4855\,c[3] - 1908\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -2891\,c[1] - 3094\,c[2] + 4687\,c[3] - 1900\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -3115\,c[1] - 3062\,c[2] + 4687\,c[3] - 1900\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -2331\,c[1] - 3286\,c[2] + 4703\,c[3] - 1900\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -5635\,c[1] - 1918\,c[2] + 4519\,c[3] - 1892\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -4851\,c[1] - 2142\,c[2] + 4535\,c[3] - 1892\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -5075\,c[1] - 2110\,c[2] + 4535\,c[3] - 1892\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -8155\,c[1] - 774\,c[2] + 4351\,c[3] - 1884\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -7595\,c[1] - 966\,c[2] + 4367\,c[3] - 1884\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -10\,675\,c[1] + 370\,c[2] + 4183\,c[3] - 1876\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -10\,115\,c[1] + 178\,c[2] + 4199\,c[3] - 1876\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -9555\,c[1] - 14\,c[2] + 4215\,c[3] - 1876\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -12\,075\,c[1] + 1130\,c[2] + 4047\,c[3] - 1868\,c[4] + 347\,c[5] - 30\,c[6] + c[7], \\
&\ -11\,515\,c[1] + 938\,c[2] + 4063\,c[3] - 1868\,c[4] + 347\,c[5] - 30\,c[6] + c[7]\}
\end{aligned}$$

```
Array[c, 7].g
```

$$-9335\,c[1] - 122\,182\,c[2] + 140\,555\,c[3] - 55\,316\,c[4] + 10\,063\,c[5] - 870\,c[6] + 29\,c[7]$$

```
cert = Flatten[
  Array[c, 7] /. FindInstance[-9335 c[1] - 122 182 c[2] + 140 555 c[3] - 55 316 c[4] +
       10 063 c[5] - 870 c[6] + 29 c[7] < 0 &&
     -1155 c[1] - 4014 c[2] + 4839 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -371 c[1] - 4238 c[2] + 4855 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2891 c[1] - 3094 c[2] + 4687 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3115 c[1] - 3062 c[2] + 4687 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2331 c[1] - 3286 c[2] + 4703 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5635 c[1] - 1918 c[2] + 4519 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4851 c[1] - 2142 c[2] + 4535 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -5075 c[1] - 2110 c[2] + 4535 c[3] - 1892 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -8155 c[1] - 774 c[2] + 4351 c[3] - 1884 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -7595 c[1] - 966 c[2] + 4367 c[3] - 1884 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -10 675 c[1] + 370 c[2] + 4183 c[3] - 1876 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -10 115 c[1] + 178 c[2] + 4199 c[3] - 1876 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -9555 c[1] - 14 c[2] + 4215 c[3] - 1876 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -12 075 c[1] + 1130 c[2] + 4047 c[3] - 1868 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -11 515 c[1] + 938 c[2] + 4063 c[3] - 1868 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
```

```
{-242, 0, -17, 0, 0, 0, 0}
```

```
GCD[-242, 0, -17, 0, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 0, -17, 0, -242}
```

```
cert.g
```

```
-130 365
```

```
cert.Transpose[A]
```

```
{197 247, 7247, 619 943, 674 151, 484 151, 1 286 847, 1 096 847, 1 151 055,
 1 899 543, 1 763 751, 2 512 239, 2 376 447, 2 240 655, 2 853 351, 2 717 559}
```

```
chi = (-7 + x)^2 (-5 + x)^8 (5 + x)^15 (388 - 431 x + 151 x^2 - 21 x^3 + x^4)
```

$$(-7+x)^2\,(-5+x)^8\,(5+x)^{15}\left(388-431\,x+151\,x^2-21\,x^3+x^4\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-5425, -380, 3203, -1512, 301, -28, 1}, {-6825, 380, 3067, -1504, 301, -28, 1},
 {-5825, -220, 3187, -1512, 301, -28, 1}, {1015, -3988, 3867, -1552, 301, -28, 1},
 {-785, -3068, 3715, -1544, 301, -28, 1}, {-65, -3292, 3731, -1544, 301, -28, 1},
 {-225, -3260, 3731, -1544, 301, -28, 1}, {-385, -3228, 3731, -1544, 301, -28, 1},
 {495, -3484, 3747, -1544, 301, -28, 1}, {335, -3452, 3747, -1544, 301, -28, 1},
 {175, -3420, 3747, -1544, 301, -28, 1}, {-2025, -2340, 3579, -1536, 301, -28, 1},
 {-2185, -2308, 3579, -1536, 301, -28, 1},
 {-1465, -2532, 3595, -1536, 301, -28, 1},
 {-1625, -2500, 3595, -1536, 301, -28, 1},
 {-1785, -2468, 3595, -1536, 301, -28, 1},
 {-1065, -2692, 3611, -1536, 301, -28, 1},
 {-1225, -2660, 3611, -1536, 301, -28, 1},
 {-505, -2884, 3627, -1536, 301, -28, 1}, {-665, -2852, 3627, -1536, 301, -28, 1},
 {-105, -3044, 3643, -1536, 301, -28, 1}, {-3825, -1420, 3427, -1528, 301, -28, 1},
 {-3425, -1580, 3443, -1528, 301, -28, 1},
 {-2865, -1772, 3459, -1528, 301, -28, 1},
 {-3025, -1740, 3459, -1528, 301, -28, 1},
 {-3185, -1708, 3459, -1528, 301, -28, 1},
 {-2465, -1932, 3475, -1528, 301, -28, 1},
 {-2625, -1900, 3475, -1528, 301, -28, 1},
 {-1905, -2124, 3491, -1528, 301, -28, 1},
 {-2065, -2092, 3491, -1528, 301, -28, 1},
 {-1505, -2284, 3507, -1528, 301, -28, 1}, {-4825, -820, 3307, -1520, 301, -28, 1},
 {-4425, -980, 3323, -1520, 301, -28, 1}, {-3865, -1172, 3339, -1520, 301, -28, 1},
 {-4025, -1140, 3339, -1520, 301, -28, 1},
 {-3465, -1332, 3355, -1520, 301, -28, 1},
 {-2905, -1524, 3371, -1520, 301, -28, 1}, {-6225, -60, 3171, -1512, 301, -28, 1},
 {-5265, -412, 3203, -1512, 301, -28, 1}, {-4865, -572, 3219, -1512, 301, -28, 1},
 {-6265, 188, 3083, -1504, 301, -28, 1}, {-7665, 948, 2947, -1496, 301, -28, 1}}
```

```
A = {{1015, -3988, 3867, -1552, 301, -28, 1},
    {-785, -3068, 3715, -1544, 301, -28, 1},
    {-65, -3292, 3731, -1544, 301, -28, 1}, {-225, -3260, 3731, -1544, 301, -28, 1},
    {-385, -3228, 3731, -1544, 301, -28, 1}, {495, -3484, 3747, -1544, 301, -28, 1},
    {335, -3452, 3747, -1544, 301, -28, 1}, {175, -3420, 3747, -1544, 301, -28, 1},
    {-2025, -2340, 3579, -1536, 301, -28, 1},
    {-2185, -2308, 3579, -1536, 301, -28, 1},
    {-1465, -2532, 3595, -1536, 301, -28, 1}, {-1625, -2500, 3595,
     -1536, 301, -28, 1}, {-1785, -2468, 3595, -1536, 301, -28, 1},
    {-1065, -2692, 3611, -1536, 301, -28, 1}, {-1225, -2660, 3611,
     -1536, 301, -28, 1}, {-505, -2884, 3627, -1536, 301, -28, 1},
    {-665, -2852, 3627, -1536, 301, -28, 1}, {-105, -3044, 3643,
     -1536, 301, -28, 1}, {-3825, -1420, 3427, -1528, 301, -28, 1},
    {-3425, -1580, 3443, -1528, 301, -28, 1}, {-2865, -1772, 3459,
     -1528, 301, -28, 1}, {-3025, -1740, 3459, -1528, 301, -28, 1},
    {-3185, -1708, 3459, -1528, 301, -28, 1}, {-2465, -1932, 3475,
     -1528, 301, -28, 1}, {-2625, -1900, 3475, -1528, 301, -28, 1},
    {-1905, -2124, 3491, -1528, 301, -28, 1}, {-2065, -2092, 3491,
     -1528, 301, -28, 1}, {-1505, -2284, 3507, -1528, 301, -28, 1},
    {-4825, -820, 3307, -1520, 301, -28, 1}, {-4425, -980, 3323,
     -1520, 301, -28, 1}, {-3865, -1172, 3339, -1520, 301, -28, 1},
    {-4025, -1140, 3339, -1520, 301, -28, 1}, {-3465, -1332, 3355,
     -1520, 301, -28, 1}, {-2905, -1524, 3371, -1520, 301, -28, 1},
    {-6225, -60, 3171, -1512, 301, -28, 1}, {-5825, -220, 3187, -1512, 301, -28, 1},
    {-5265, -412, 3203, -1512, 301, -28, 1},
    {-5425, -380, 3203, -1512, 301, -28, 1},
    {-4865, -572, 3219, -1512, 301, -28, 1}, {-6825, 380, 3067, -1504, 301, -28, 1},
    {-6265, 188, 3083, -1504, 301, -28, 1}, {-7665, 948, 2947, -1496, 301, -28, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
1015 & -3988 & 3867 & -1552 & 301 & -28 & 1 \\
-785 & -3068 & 3715 & -1544 & 301 & -28 & 1 \\
-65 & -3292 & 3731 & -1544 & 301 & -28 & 1 \\
-225 & -3260 & 3731 & -1544 & 301 & -28 & 1 \\
-385 & -3228 & 3731 & -1544 & 301 & -28 & 1 \\
495 & -3484 & 3747 & -1544 & 301 & -28 & 1 \\
335 & -3452 & 3747 & -1544 & 301 & -28 & 1 \\
175 & -3420 & 3747 & -1544 & 301 & -28 & 1 \\
-2025 & -2340 & 3579 & -1536 & 301 & -28 & 1 \\
-2185 & -2308 & 3579 & -1536 & 301 & -28 & 1 \\
-1465 & -2532 & 3595 & -1536 & 301 & -28 & 1 \\
-1625 & -2500 & 3595 & -1536 & 301 & -28 & 1 \\
-1785 & -2468 & 3595 & -1536 & 301 & -28 & 1 \\
-1065 & -2692 & 3611 & -1536 & 301 & -28 & 1 \\
-1225 & -2660 & 3611 & -1536 & 301 & -28 & 1 \\
-505 & -2884 & 3627 & -1536 & 301 & -28 & 1 \\
-665 & -2852 & 3627 & -1536 & 301 & -28 & 1 \\
-105 & -3044 & 3643 & -1536 & 301 & -28 & 1 \\
-3825 & -1420 & 3427 & -1528 & 301 & -28 & 1 \\
-3425 & -1580 & 3443 & -1528 & 301 & -28 & 1 \\
-2865 & -1772 & 3459 & -1528 & 301 & -28 & 1 \\
-3025 & -1740 & 3459 & -1528 & 301 & -28 & 1 \\
-3185 & -1708 & 3459 & -1528 & 301 & -28 & 1 \\
-2465 & -1932 & 3475 & -1528 & 301 & -28 & 1 \\
-2625 & -1900 & 3475 & -1528 & 301 & -28 & 1 \\
-1905 & -2124 & 3491 & -1528 & 301 & -28 & 1 \\
-2065 & -2092 & 3491 & -1528 & 301 & -28 & 1 \\
-1505 & -2284 & 3507 & -1528 & 301 & -28 & 1 \\
-4825 & -820 & 3307 & -1520 & 301 & -28 & 1 \\
-4425 & -980 & 3323 & -1520 & 301 & -28 & 1 \\
-3865 & -1172 & 3339 & -1520 & 301 & -28 & 1 \\
-4025 & -1140 & 3339 & -1520 & 301 & -28 & 1 \\
-3465 & -1332 & 3355 & -1520 & 301 & -28 & 1 \\
-2905 & -1524 & 3371 & -1520 & 301 & -28 & 1 \\
-6225 & -60 & 3171 & -1512 & 301 & -28 & 1 \\
-5825 & -220 & 3187 & -1512 & 301 & -28 & 1 \\
-5265 & -412 & 3203 & -1512 & 301 & -28 & 1 \\
-5425 & -380 & 3203 & -1512 & 301 & -28 & 1 \\
-4865 & -572 & 3219 & -1512 & 301 & -28 & 1 \\
-6825 & 380 & 3067 & -1504 & 301 & -28 & 1 \\
-6265 & 188 & 3083 & -1504 & 301 & -28 & 1 \\
-7665 & 948 & 2947 & -1496 & 301 & -28 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{235, -96\,468, 108\,063, -44\,736, 8729, -812, 29\}$$

```
Array[c, 7].Transpose[A]
```

```
{1015 c[1] - 3988 c[2] + 3867 c[3] - 1552 c[4] + 301 c[5] - 28 c[6] + c[7],
 -785 c[1] - 3068 c[2] + 3715 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 -65 c[1] - 3292 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 -225 c[1] - 3260 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 -385 c[1] - 3228 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 495 c[1] - 3484 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 335 c[1] - 3452 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 175 c[1] - 3420 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2025 c[1] - 2340 c[2] + 3579 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2185 c[1] - 2308 c[2] + 3579 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1465 c[1] - 2532 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1625 c[1] - 2500 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1785 c[1] - 2468 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1065 c[1] - 2692 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1225 c[1] - 2660 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -505 c[1] - 2884 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -665 c[1] - 2852 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -105 c[1] - 3044 c[2] + 3643 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3825 c[1] - 1420 c[2] + 3427 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3425 c[1] - 1580 c[2] + 3443 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2865 c[1] - 1772 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3025 c[1] - 1740 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3185 c[1] - 1708 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2465 c[1] - 1932 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2625 c[1] - 1900 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1905 c[1] - 2124 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2065 c[1] - 2092 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -1505 c[1] - 2284 c[2] + 3507 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7],
 -4825 c[1] - 820 c[2] + 3307 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -4425 c[1] - 980 c[2] + 3323 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3865 c[1] - 1172 c[2] + 3339 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -4025 c[1] - 1140 c[2] + 3339 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -3465 c[1] - 1332 c[2] + 3355 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -2905 c[1] - 1524 c[2] + 3371 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7],
 -6225 c[1] - 60 c[2] + 3171 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7],
 -5825 c[1] - 220 c[2] + 3187 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7],
 -5265 c[1] - 412 c[2] + 3203 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7],
 -5425 c[1] - 380 c[2] + 3203 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7],
 -4865 c[1] - 572 c[2] + 3219 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7],
 -6825 c[1] + 380 c[2] + 3067 c[3] - 1504 c[4] + 301 c[5] - 28 c[6] + c[7],
 -6265 c[1] + 188 c[2] + 3083 c[3] - 1504 c[4] + 301 c[5] - 28 c[6] + c[7],
 -7665 c[1] + 948 c[2] + 2947 c[3] - 1496 c[4] + 301 c[5] - 28 c[6] + c[7]}
```

```
Array[c, 7].g
```

```
235 c[1] - 96 468 c[2] + 108 063 c[3] - 44 736 c[4] + 8729 c[5] - 812 c[6] + 29 c[7]
```

```
cert = Flatten[Array[c, 7] /. FindInstance[
    235 c[1] - 96 468 c[2] + 108 063 c[3] - 44 736 c[4] + 8729 c[5] - 812 c[6] + 29 c[7] <
      0 && 1015 c[1] - 3988 c[2] + 3867 c[3] - 1552 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -785 c[1] - 3068 c[2] + 3715 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -65 c[1] - 3292 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -225 c[1] - 3260 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -385 c[1] - 3228 c[2] + 3731 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     495 c[1] - 3484 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     335 c[1] - 3452 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     175 c[1] - 3420 c[2] + 3747 c[3] - 1544 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2025 c[1] - 2340 c[2] + 3579 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2185 c[1] - 2308 c[2] + 3579 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1465 c[1] - 2532 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1625 c[1] - 2500 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1785 c[1] - 2468 c[2] + 3595 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1065 c[1] - 2692 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1225 c[1] - 2660 c[2] + 3611 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -505 c[1] - 2884 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -665 c[1] - 2852 c[2] + 3627 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -105 c[1] - 3044 c[2] + 3643 c[3] - 1536 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3825 c[1] - 1420 c[2] + 3427 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3425 c[1] - 1580 c[2] + 3443 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2865 c[1] - 1772 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3025 c[1] - 1740 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3185 c[1] - 1708 c[2] + 3459 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2465 c[1] - 1932 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2625 c[1] - 1900 c[2] + 3475 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1905 c[1] - 2124 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2065 c[1] - 2092 c[2] + 3491 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -1505 c[1] - 2284 c[2] + 3507 c[3] - 1528 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -4825 c[1] - 820 c[2] + 3307 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -4425 c[1] - 980 c[2] + 3323 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3865 c[1] - 1172 c[2] + 3339 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -4025 c[1] - 1140 c[2] + 3339 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -3465 c[1] - 1332 c[2] + 3355 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -2905 c[1] - 1524 c[2] + 3371 c[3] - 1520 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -6225 c[1] - 60 c[2] + 3171 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -5825 c[1] - 220 c[2] + 3187 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -5265 c[1] - 412 c[2] + 3203 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -5425 c[1] - 380 c[2] + 3203 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -4865 c[1] - 572 c[2] + 3219 c[3] - 1512 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -6825 c[1] + 380 c[2] + 3067 c[3] - 1504 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -6265 c[1] + 188 c[2] + 3083 c[3] - 1504 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0 &&
     -7665 c[1] + 948 c[2] + 2947 c[3] - 1496 c[4] + 301 c[5] - 28 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
{238, 978, 3367, 6028, 0, 0, 0}
```

```
GCD[238, 978, 3367, 6028, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 6028, 3367, 978, 238}
```

```
cert.g
```

```
-110 261
```

```
cert.Transpose[A]
```

```
{6039, 13 839, 19 999, 13 215, 6431, 19 375, 12 591, 5807, 21 015, 14 231,
 20 391, 13 607, 6823, 12 983, 6199, 12 359, 5575, 4951, 28 815, 21 407,
 20 783, 13 999, 7215, 13 375, 6591, 12 751, 5967, 5343, 21 799, 14 391, 13 767,
 6983, 6359, 5735, 22 191, 14 783, 14 159, 7375, 6751, 7767, 7143, 7535}
```

```
chi = (-7 + x)^3 (-5 + x)^7 (5 + x)^15 (256 - 313 x + 123 x^2 - 19 x^3 + x^4)
```

```
(-7 + x)^3 (-5 + x)^7 (5 + x)^15 (256 - 313 x + 123 x^2 - 19 x^3 + x^4)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-3675, 70, 2263, -1196, 259, -26, 1},
 {-2235, -938, 2487, -1212, 259, -26, 1}, {-1995, -1066, 2503, -1212, 259, -26, 1},
 {245, -2394, 2759, -1228, 259, -26, 1}, {-995, -1666, 2623, -1220, 259, -26, 1},
 {-1155, -1634, 2623, -1220, 259, -26, 1}, {-275, -1890, 2639, -1220, 259, -26, 1},
 {-435, -1858, 2639, -1220, 259, -26, 1}, {-659, -1826, 2639, -1220, 259, -26, 1},
 {-595, -1826, 2639, -1220, 259, -26, 1}, {-35, -2018, 2655, -1220, 259, -26, 1},
 {-259, -1986, 2655, -1220, 259, -26, 1}, {-1675, -1130, 2503, -1212, 259, -26, 1},
 {-1835, -1098, 2503, -1212, 259, -26, 1},
 {-1275, -1290, 2519, -1212, 259, -26, 1},
 {-1435, -1258, 2519, -1212, 259, -26, 1}, {-715, -1482, 2535, -1212, 259, -26, 1},
 {-875, -1450, 2535, -1212, 259, -26, 1}, {-3075, -370, 2367, -1204, 259, -26, 1},
 {-2675, -530, 2383, -1204, 259, -26, 1}, {-2835, -498, 2383, -1204, 259, -26, 1},
 {-2275, -690, 2399, -1204, 259, -26, 1}, {-1715, -882, 2415, -1204, 259, -26, 1},
 {-4075, 230, 2247, -1196, 259, -26, 1}, {-3115, -122, 2279, -1196, 259, -26, 1}}
```

```
A = {{245, -2394, 2759, -1228, 259, -26, 1}, {-995, -1666, 2623, -1220, 259, -26, 1},
   {-1155, -1634, 2623, -1220, 259, -26, 1},
   {-275, -1890, 2639, -1220, 259, -26, 1}, {-435, -1858, 2639,
    -1220, 259, -26, 1}, {-659, -1826, 2639, -1220, 259, -26, 1},
   {-595, -1826, 2639, -1220, 259, -26, 1}, {-35, -2018, 2655, -1220, 259, -26, 1},
   {-259, -1986, 2655, -1220, 259, -26, 1},
   {-2235, -938, 2487, -1212, 259, -26, 1}, {-1675, -1130, 2503,
    -1212, 259, -26, 1}, {-1835, -1098, 2503, -1212, 259, -26, 1},
   {-1995, -1066, 2503, -1212, 259, -26, 1}, {-1275, -1290, 2519,
    -1212, 259, -26, 1}, {-1435, -1258, 2519, -1212, 259, -26, 1},
   {-715, -1482, 2535, -1212, 259, -26, 1}, {-875, -1450, 2535,
    -1212, 259, -26, 1}, {-3075, -370, 2367, -1204, 259, -26, 1},
   {-2675, -530, 2383, -1204, 259, -26, 1}, {-2835, -498, 2383,
    -1204, 259, -26, 1}, {-2275, -690, 2399, -1204, 259, -26, 1},
   {-1715, -882, 2415, -1204, 259, -26, 1}, {-4075, 230, 2247, -1196, 259, -26, 1},
   {-3675, 70, 2263, -1196, 259, -26, 1}, {-3115, -122, 2279, -1196, 259, -26, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 245 & -2394 & 2759 & -1228 & 259 & -26 & 1 \\ -995 & -1666 & 2623 & -1220 & 259 & -26 & 1 \\ -1155 & -1634 & 2623 & -1220 & 259 & -26 & 1 \\ -275 & -1890 & 2639 & -1220 & 259 & -26 & 1 \\ -435 & -1858 & 2639 & -1220 & 259 & -26 & 1 \\ -659 & -1826 & 2639 & -1220 & 259 & -26 & 1 \\ -595 & -1826 & 2639 & -1220 & 259 & -26 & 1 \\ -35 & -2018 & 2655 & -1220 & 259 & -26 & 1 \\ -259 & -1986 & 2655 & -1220 & 259 & -26 & 1 \\ -2235 & -938 & 2487 & -1212 & 259 & -26 & 1 \\ -1675 & -1130 & 2503 & -1212 & 259 & -26 & 1 \\ -1835 & -1098 & 2503 & -1212 & 259 & -26 & 1 \\ -1995 & -1066 & 2503 & -1212 & 259 & -26 & 1 \\ -1275 & -1290 & 2519 & -1212 & 259 & -26 & 1 \\ -1435 & -1258 & 2519 & -1212 & 259 & -26 & 1 \\ -715 & -1482 & 2535 & -1212 & 259 & -26 & 1 \\ -875 & -1450 & 2535 & -1212 & 259 & -26 & 1 \\ -3075 & -370 & 2367 & -1204 & 259 & -26 & 1 \\ -2675 & -530 & 2383 & -1204 & 259 & -26 & 1 \\ -2835 & -498 & 2383 & -1204 & 259 & -26 & 1 \\ -2275 & -690 & 2399 & -1204 & 259 & -26 & 1 \\ -1715 & -882 & 2415 & -1204 & 259 & -26 & 1 \\ -4075 & 230 & 2247 & -1196 & 259 & -26 & 1 \\ -3675 & 70 & 2263 & -1196 & 259 & -26 & 1 \\ -3115 & -122 & 2279 & -1196 & 259 & -26 & 1 \end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

```
{-2295, -62 954, 78 403, -35 492, 7511, -754, 29}
```

```
Array[c, 7].Transpose[A]
```

```
{245 c[1] - 2394 c[2] + 2759 c[3] - 1228 c[4] + 259 c[5] - 26 c[6] + c[7],
 -995 c[1] - 1666 c[2] + 2623 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1155 c[1] - 1634 c[2] + 2623 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -275 c[1] - 1890 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -435 c[1] - 1858 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -659 c[1] - 1826 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -595 c[1] - 1826 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -35 c[1] - 2018 c[2] + 2655 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -259 c[1] - 1986 c[2] + 2655 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7],
 -2235 c[1] - 938 c[2] + 2487 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1675 c[1] - 1130 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1835 c[1] - 1098 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1995 c[1] - 1066 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1275 c[1] - 1290 c[2] + 2519 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1435 c[1] - 1258 c[2] + 2519 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -715 c[1] - 1482 c[2] + 2535 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -875 c[1] - 1450 c[2] + 2535 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7],
 -3075 c[1] - 370 c[2] + 2367 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7],
 -2675 c[1] - 530 c[2] + 2383 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7],
 -2835 c[1] - 498 c[2] + 2383 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7],
 -2275 c[1] - 690 c[2] + 2399 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7],
 -1715 c[1] - 882 c[2] + 2415 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7],
 -4075 c[1] + 230 c[2] + 2247 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7],
 -3675 c[1] + 70 c[2] + 2263 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7],
 -3115 c[1] - 122 c[2] + 2279 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7]}
```

```
Array[c, 7].g
```

```
-2295 c[1] - 62 954 c[2] + 78 403 c[3] - 35 492 c[4] + 7511 c[5] - 754 c[6] + 29 c[7]
```

```
cert = Flatten[Array[c, 7] /. FindInstance[
    -2295 c[1] - 62 954 c[2] + 78 403 c[3] - 35 492 c[4] + 7511 c[5] - 754 c[6] + 29 c[7] <
      0 && 245 c[1] - 2394 c[2] + 2759 c[3] - 1228 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -995 c[1] - 1666 c[2] + 2623 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1155 c[1] - 1634 c[2] + 2623 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -275 c[1] - 1890 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -435 c[1] - 1858 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -659 c[1] - 1826 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -595 c[1] - 1826 c[2] + 2639 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -35 c[1] - 2018 c[2] + 2655 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -259 c[1] - 1986 c[2] + 2655 c[3] - 1220 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -2235 c[1] - 938 c[2] + 2487 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1675 c[1] - 1130 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1835 c[1] - 1098 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1995 c[1] - 1066 c[2] + 2503 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1275 c[1] - 1290 c[2] + 2519 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1435 c[1] - 1258 c[2] + 2519 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -715 c[1] - 1482 c[2] + 2535 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -875 c[1] - 1450 c[2] + 2535 c[3] - 1212 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -3075 c[1] - 370 c[2] + 2367 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -2675 c[1] - 530 c[2] + 2383 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -2835 c[1] - 498 c[2] + 2383 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -2275 c[1] - 690 c[2] + 2399 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -1715 c[1] - 882 c[2] + 2415 c[3] - 1204 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -4075 c[1] + 230 c[2] + 2247 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -3675 c[1] + 70 c[2] + 2263 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0 &&
     -3115 c[1] - 122 c[2] + 2279 c[3] - 1196 c[4] + 259 c[5] - 26 c[6] + c[7] ≥ 0,
    Array[c, 7], Integers]]
```

```
{174, 616, 1795, 2863, 0, 0, 0}
```

```
GCD[174, 616, 1795, 2863, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 2863, 1795, 616, 174}
```

```
cert.g
```

```
-59 205
```

```
cert.Transpose[A]
```

```
{4567, 16 039, 7911, 32 055, 23 927, 4663, 15 799, 23 687,
 4423, 27 511, 35 399, 27 271, 19 143, 35 159, 27 031, 43 047, 34 919,
 38 743, 38 503, 30 375, 38 263, 46 151, 41 847, 41 607, 49 495}
```

```
chi = (-5 + x)^9 (5 + x)^15 (-4672 + 4823 x - 1874 x^2 + 344 x^3 - 30 x^4 + x^5)
```

```
(-5 + x)^9 (5 + x)^15 (-4672 + 4823 x - 1874 x^2 + 344 x^3 - 30 x^4 + x^5)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{845, -5934, 5303, -1940, 347, -30, 1},
 {1501, -6158, 5319, -1940, 347, -30, 1}, {-75, -5270, 5167, -1932, 347, -30, 1},
 {-235, -5238, 5167, -1932, 347, -30, 1}, {-395, -5206, 5167, -1932, 347, -30, 1},
 {421, -5462, 5183, -1932, 347, -30, 1}, {485, -5462, 5183, -1932, 347, -30, 1},
 {261, -5430, 5183, -1932, 347, -30, 1}, {325, -5430, 5183, -1932, 347, -30, 1},
 {101, -5398, 5183, -1932, 347, -30, 1}, {165, -5398, 5183, -1932, 347, -30, 1},
 {661, -5590, 5199, -1932, 347, -30, 1}, {-1875, -4350, 5015, -1924, 347, -30, 1},
 {-2035, -4318, 5015, -1924, 347, -30, 1},
 {-1155, -4574, 5031, -1924, 347, -30, 1},
 {-1315, -4542, 5031, -1924, 347, -30, 1},
 {-1475, -4510, 5031, -1924, 347, -30, 1},
 {-1635, -4478, 5031, -1924, 347, -30, 1},
 {-595, -4766, 5047, -1924, 347, -30, 1}, {-755, -4734, 5047, -1924, 347, -30, 1},
 {-915, -4702, 5047, -1924, 347, -30, 1}, {-1139, -4670, 5047, -1924, 347, -30, 1},
 {-1075, -4670, 5047, -1924, 347, -30, 1},
 {-355, -4894, 5063, -1924, 347, -30, 1}, {-579, -4862, 5063, -1924, 347, -30, 1},
 {-515, -4862, 5063, -1924, 347, -30, 1}, {-3515, -3462, 4863, -1916, 347, -30, 1},
 {-3115, -3622, 4879, -1916, 347, -30, 1},
 {-3275, -3590, 4879, -1916, 347, -30, 1},
 {-2555, -3814, 4895, -1916, 347, -30, 1},
 {-2715, -3782, 4895, -1916, 347, -30, 1},
 {-2875, -3750, 4895, -1916, 347, -30, 1},
 {-2155, -3974, 4911, -1916, 347, -30, 1},
 {-2315, -3942, 4911, -1916, 347, -30, 1},
 {-1595, -4166, 4927, -1916, 347, -30, 1},
 {-1755, -4134, 4927, -1916, 347, -30, 1},
 {-1979, -4102, 4927, -1916, 347, -30, 1},
 {-4515, -2862, 4743, -1908, 347, -30, 1},
 {-3955, -3054, 4759, -1908, 347, -30, 1},
 {-4115, -3022, 4759, -1908, 347, -30, 1},
 {-3555, -3214, 4775, -1908, 347, -30, 1},
 {-3715, -3182, 4775, -1908, 347, -30, 1},
 {-2995, -3406, 4791, -1908, 347, -30, 1},
 {-5515, -2262, 4623, -1900, 347, -30, 1},
 {-4955, -2454, 4639, -1900, 347, -30, 1}}
```

```
A = {{845, -5934, 5303, -1940, 347, -30, 1}, {1501, -6158, 5319, -1940, 347, -30, 1},
    {-75, -5270, 5167, -1932, 347, -30, 1}, {-235, -5238, 5167, -1932, 347, -30, 1},
    {-395, -5206, 5167, -1932, 347, -30, 1}, {421, -5462, 5183, -1932, 347, -30, 1},
    {485, -5462, 5183, -1932, 347, -30, 1}, {261, -5430, 5183, -1932, 347, -30, 1},
    {325, -5430, 5183, -1932, 347, -30, 1}, {101, -5398, 5183, -1932, 347, -30, 1},
    {165, -5398, 5183, -1932, 347, -30, 1}, {661, -5590, 5199, -1932, 347, -30, 1},
    {-1875, -4350, 5015, -1924, 347, -30, 1}, {-2035, -4318, 5015,
     -1924, 347, -30, 1}, {-1155, -4574, 5031, -1924, 347, -30, 1},
    {-1315, -4542, 5031, -1924, 347, -30, 1}, {-1475, -4510, 5031,
     -1924, 347, -30, 1}, {-1635, -4478, 5031, -1924, 347, -30, 1},
    {-595, -4766, 5047, -1924, 347, -30, 1}, {-755, -4734, 5047,
     -1924, 347, -30, 1}, {-915, -4702, 5047, -1924, 347, -30, 1},
    {-1139, -4670, 5047, -1924, 347, -30, 1}, {-1075, -4670, 5047,
     -1924, 347, -30, 1}, {-355, -4894, 5063, -1924, 347, -30, 1},
    {-579, -4862, 5063, -1924, 347, -30, 1}, {-515, -4862, 5063,
     -1924, 347, -30, 1}, {-3515, -3462, 4863, -1916, 347, -30, 1},
    {-3115, -3622, 4879, -1916, 347, -30, 1}, {-3275, -3590, 4879,
     -1916, 347, -30, 1}, {-2555, -3814, 4895, -1916, 347, -30, 1},
    {-2715, -3782, 4895, -1916, 347, -30, 1}, {-2875, -3750, 4895,
     -1916, 347, -30, 1}, {-2155, -3974, 4911, -1916, 347, -30, 1},
    {-2315, -3942, 4911, -1916, 347, -30, 1}, {-1595, -4166, 4927,
     -1916, 347, -30, 1}, {-1755, -4134, 4927, -1916, 347, -30, 1},
    {-1979, -4102, 4927, -1916, 347, -30, 1}, {-4515, -2862, 4743,
     -1908, 347, -30, 1}, {-3955, -3054, 4759, -1908, 347, -30, 1},
    {-4115, -3022, 4759, -1908, 347, -30, 1}, {-3555, -3214, 4775,
     -1908, 347, -30, 1}, {-3715, -3182, 4775, -1908, 347, -30, 1},
    {-2995, -3406, 4791, -1908, 347, -30, 1}, {-5515, -2262, 4623,
     -1900, 347, -30, 1}, {-4955, -2454, 4639, -1900, 347, -30, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
845 & -5934 & 5303 & -1940 & 347 & -30 & 1 \\
1501 & -6158 & 5319 & -1940 & 347 & -30 & 1 \\
-75 & -5270 & 5167 & -1932 & 347 & -30 & 1 \\
-235 & -5238 & 5167 & -1932 & 347 & -30 & 1 \\
-395 & -5206 & 5167 & -1932 & 347 & -30 & 1 \\
421 & -5462 & 5183 & -1932 & 347 & -30 & 1 \\
485 & -5462 & 5183 & -1932 & 347 & -30 & 1 \\
261 & -5430 & 5183 & -1932 & 347 & -30 & 1 \\
325 & -5430 & 5183 & -1932 & 347 & -30 & 1 \\
101 & -5398 & 5183 & -1932 & 347 & -30 & 1 \\
165 & -5398 & 5183 & -1932 & 347 & -30 & 1 \\
661 & -5590 & 5199 & -1932 & 347 & -30 & 1 \\
-1875 & -4350 & 5015 & -1924 & 347 & -30 & 1 \\
-2035 & -4318 & 5015 & -1924 & 347 & -30 & 1 \\
-1155 & -4574 & 5031 & -1924 & 347 & -30 & 1 \\
-1315 & -4542 & 5031 & -1924 & 347 & -30 & 1 \\
-1475 & -4510 & 5031 & -1924 & 347 & -30 & 1 \\
-1635 & -4478 & 5031 & -1924 & 347 & -30 & 1 \\
-595 & -4766 & 5047 & -1924 & 347 & -30 & 1 \\
-755 & -4734 & 5047 & -1924 & 347 & -30 & 1 \\
-915 & -4702 & 5047 & -1924 & 347 & -30 & 1 \\
-1139 & -4670 & 5047 & -1924 & 347 & -30 & 1 \\
-1075 & -4670 & 5047 & -1924 & 347 & -30 & 1 \\
-355 & -4894 & 5063 & -1924 & 347 & -30 & 1 \\
-579 & -4862 & 5063 & -1924 & 347 & -30 & 1 \\
-515 & -4862 & 5063 & -1924 & 347 & -30 & 1 \\
-3515 & -3462 & 4863 & -1916 & 347 & -30 & 1 \\
-3115 & -3622 & 4879 & -1916 & 347 & -30 & 1 \\
-3275 & -3590 & 4879 & -1916 & 347 & -30 & 1 \\
-2555 & -3814 & 4895 & -1916 & 347 & -30 & 1 \\
-2715 & -3782 & 4895 & -1916 & 347 & -30 & 1 \\
-2875 & -3750 & 4895 & -1916 & 347 & -30 & 1 \\
-2155 & -3974 & 4911 & -1916 & 347 & -30 & 1 \\
-2315 & -3942 & 4911 & -1916 & 347 & -30 & 1 \\
-1595 & -4166 & 4927 & -1916 & 347 & -30 & 1 \\
-1755 & -4134 & 4927 & -1916 & 347 & -30 & 1 \\
-1979 & -4102 & 4927 & -1916 & 347 & -30 & 1 \\
-4515 & -2862 & 4743 & -1908 & 347 & -30 & 1 \\
-3955 & -3054 & 4759 & -1908 & 347 & -30 & 1 \\
-4115 & -3022 & 4759 & -1908 & 347 & -30 & 1 \\
-3555 & -3214 & 4775 & -1908 & 347 & -30 & 1 \\
-3715 & -3182 & 4775 & -1908 & 347 & -30 & 1 \\
-2995 & -3406 & 4791 & -1908 & 347 & -30 & 1 \\
-5515 & -2262 & 4623 & -1900 & 347 & -30 & 1 \\
-4955 & -2454 & 4639 & -1900 & 347 & -30 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{19\,585, -163\,118, 150\,995, -56\,044, 10\,063, -870, 29\}$$

```
Array[c, 7].Transpose[A]
```

```
{845 c[1] - 5934 c[2] + 5303 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7],
 1501 c[1] - 6158 c[2] + 5319 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7],
 -75 c[1] - 5270 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 -235 c[1] - 5238 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 -395 c[1] - 5206 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 421 c[1] - 5462 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 485 c[1] - 5462 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 261 c[1] - 5430 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 325 c[1] - 5430 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 101 c[1] - 5398 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 165 c[1] - 5398 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 661 c[1] - 5590 c[2] + 5199 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1875 c[1] - 4350 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2035 c[1] - 4318 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1155 c[1] - 4574 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1315 c[1] - 4542 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1475 c[1] - 4510 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1635 c[1] - 4478 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -595 c[1] - 4766 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -755 c[1] - 4734 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -915 c[1] - 4702 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1139 c[1] - 4670 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1075 c[1] - 4670 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -355 c[1] - 4894 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -579 c[1] - 4862 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -515 c[1] - 4862 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3515 c[1] - 3462 c[2] + 4863 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3115 c[1] - 3622 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3275 c[1] - 3590 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2555 c[1] - 3814 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2715 c[1] - 3782 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2875 c[1] - 3750 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2155 c[1] - 3974 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2315 c[1] - 3942 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1595 c[1] - 4166 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1755 c[1] - 4134 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -1979 c[1] - 4102 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7],
 -4515 c[1] - 2862 c[2] + 4743 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3955 c[1] - 3054 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -4115 c[1] - 3022 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3555 c[1] - 3214 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -3715 c[1] - 3182 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -2995 c[1] - 3406 c[2] + 4791 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7],
 -5515 c[1] - 2262 c[2] + 4623 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7],
 -4955 c[1] - 2454 c[2] + 4639 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7]}
```

```
Array[c, 7].g
```

```
19 585 c[1] - 163 118 c[2] + 150 995 c[3] - 56 044 c[4] + 10 063 c[5] - 870 c[6] + 29 c[7]
```

```
cert = Flatten[
  Array[c, 7] /. FindInstance[19 585 c[1] - 163 118 c[2] + 150 995 c[3] - 56 044 c[4] +
       10 063 c[5] - 870 c[6] + 29 c[7] < 0 &&
     845 c[1] - 5934 c[2] + 5303 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     1501 c[1] - 6158 c[2] + 5319 c[3] - 1940 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -75 c[1] - 5270 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -235 c[1] - 5238 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -395 c[1] - 5206 c[2] + 5167 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     421 c[1] - 5462 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     485 c[1] - 5462 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     261 c[1] - 5430 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     325 c[1] - 5430 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     101 c[1] - 5398 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     165 c[1] - 5398 c[2] + 5183 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     661 c[1] - 5590 c[2] + 5199 c[3] - 1932 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1875 c[1] - 4350 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2035 c[1] - 4318 c[2] + 5015 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1155 c[1] - 4574 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1315 c[1] - 4542 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1475 c[1] - 4510 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1635 c[1] - 4478 c[2] + 5031 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -595 c[1] - 4766 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -755 c[1] - 4734 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -915 c[1] - 4702 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1139 c[1] - 4670 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1075 c[1] - 4670 c[2] + 5047 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -355 c[1] - 4894 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -579 c[1] - 4862 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -515 c[1] - 4862 c[2] + 5063 c[3] - 1924 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3515 c[1] - 3462 c[2] + 4863 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3115 c[1] - 3622 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3275 c[1] - 3590 c[2] + 4879 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2555 c[1] - 3814 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2715 c[1] - 3782 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2875 c[1] - 3750 c[2] + 4895 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2155 c[1] - 3974 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -2315 c[1] - 3942 c[2] + 4911 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1595 c[1] - 4166 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1755 c[1] - 4134 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -1979 c[1] - 4102 c[2] + 4927 c[3] - 1916 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4515 c[1] - 2862 c[2] + 4743 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3955 c[1] - 3054 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -4115 c[1] - 3022 c[2] + 4759 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
     -3555 c[1] - 3214 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
```

```
      -3715 c[1] - 3182 c[2] + 4775 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
      -2995 c[1] - 3406 c[2] + 4791 c[3] - 1908 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
      -5515 c[1] - 2262 c[2] + 4623 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0 &&
      -4955 c[1] - 2454 c[2] + 4639 c[3] - 1900 c[4] + 347 c[5] - 30 c[6] + c[7] ≥ 0,
     Array[c, 7], Integers]]
```

```
{425, 1747, 6111, 11531, 0, 0, 0}
```

```
GCD[425, 1747, 6111, 11531, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 11531, 6111, 1747, 425}
```

```
cert.g
```

```
-156440
```

```
cert.Transpose[A]
```

```
{28920, 14168, 59080, 46984, 34888, 32232, 59432, 20136,
 47336, 8040, 35240, 8392, 64696, 52600, 77144, 65048, 52952, 40856,
 77496, 65400, 53304, 14008, 41208, 53656, 14360, 41560, 82408,
 70664, 58568, 71016, 58920, 46824, 59272, 47176, 59624, 47528,
 8232, 64536, 64888, 52792, 53144, 41048, 53496, 46664, 47016}
```

```
chi = (-7 + x) (-5 + x)^8 (5 + x)^15 (-3176 + 3557 x - 1500 x^2 + 298 x^3 - 28 x^4 + x^5)
```

$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\left(-3176+3557\,x-1500\,x^{2}+298\,x^{3}-28\,x^{4}+x^{5}\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{1295, 24 371, -30 241, 14 683, -3659, 497, -35, 1},
 {2415, 23 987, -30 209, 14 683, -3659, 497, -35, 1},
 {-385, 25 507, -30 481, 14 699, -3659, 497, -35, 1},
 {735, 25 123, -30 449, 14 699, -3659, 497, -35, 1},
 {-2065, 26 643, -30 721, 14 715, -3659, 497, -35, 1},
 {9975, 18 035, -28 561, 14 491, -3651, 497, -35, 1},
 {11 095, 17 651, -28 529, 14 491, -3651, 497, -35, 1},
 {7175, 19 555, -28 833, 14 507, -3651, 497, -35, 1},
 {8295, 19 171, -28 801, 14 507, -3651, 497, -35, 1},
 {9415, 18 787, -28 769, 14 507, -3651, 497, -35, 1},
 {4375, 21 075, -29 105, 14 523, -3651, 497, -35, 1},
 {5495, 20 691, -29 073, 14 523, -3651, 497, -35, 1},
 {6615, 20 307, -29 041, 14 523, -3651, 497, -35, 1},
 {2695, 22 211, -29 345, 14 539, -3651, 497, -35, 1},
 {3815, 21 827, -29 313, 14 539, -3651, 497, -35, 1},
 {16 975, 12 835, -27 121, 14 315, -3643, 497, -35, 1},
 {14 175, 14 355, -27 393, 14 331, -3643, 497, -35, 1},
 {15 295, 13 971, -27 361, 14 331, -3643, 497, -35, 1},
 {11 375, 15 875, -27 665, 14 347, -3643, 497, -35, 1},
 {12 495, 15 491, -27 633, 14 347, -3643, 497, -35, 1},
 {13 615, 15 107, -27 601, 14 347, -3643, 497, -35, 1},
 {8575, 17 395, -27 937, 14 363, -3643, 497, -35, 1},
 {23 975, 7635, -25 681, 14 139, -3635, 497, -35, 1},
 {21 175, 9155, -25 953, 14 155, -3635, 497, -35, 1},
 {18 375, 10 675, -26 225, 14 171, -3635, 497, -35, 1},
 {14 455, 12 579, -26 529, 14 187, -3635, 497, -35, 1},
 {28 175, 3955, -24 513, 13 979, -3627, 497, -35, 1}}
```

```
A = {{1295, 24 371, -30 241, 14 683, -3659, 497, -35, 1},
    {2415, 23 987, -30 209, 14 683, -3659, 497, -35, 1},
    {-385, 25 507, -30 481, 14 699, -3659, 497, -35, 1},
    {735, 25 123, -30 449, 14 699, -3659, 497, -35, 1},
    {-2065, 26 643, -30 721, 14 715, -3659, 497, -35, 1},
    {9975, 18 035, -28 561, 14 491, -3651, 497, -35, 1},
    {11 095, 17 651, -28 529, 14 491, -3651, 497, -35, 1},
    {7175, 19 555, -28 833, 14 507, -3651, 497, -35, 1},
    {8295, 19 171, -28 801, 14 507, -3651, 497, -35, 1},
    {9415, 18 787, -28 769, 14 507, -3651, 497, -35, 1},
    {4375, 21 075, -29 105, 14 523, -3651, 497, -35, 1},
    {5495, 20 691, -29 073, 14 523, -3651, 497, -35, 1},
    {6615, 20 307, -29 041, 14 523, -3651, 497, -35, 1},
    {2695, 22 211, -29 345, 14 539, -3651, 497, -35, 1},
    {3815, 21 827, -29 313, 14 539, -3651, 497, -35, 1},
    {16 975, 12 835, -27 121, 14 315, -3643, 497, -35, 1},
    {14 175, 14 355, -27 393, 14 331, -3643, 497, -35, 1},
    {15 295, 13 971, -27 361, 14 331, -3643, 497, -35, 1},
    {11 375, 15 875, -27 665, 14 347, -3643, 497, -35, 1},
    {12 495, 15 491, -27 633, 14 347, -3643, 497, -35, 1},
    {13 615, 15 107, -27 601, 14 347, -3643, 497, -35, 1},
    {8575, 17 395, -27 937, 14 363, -3643, 497, -35, 1},
    {23 975, 7635, -25 681, 14 139, -3635, 497, -35, 1},
    {21 175, 9155, -25 953, 14 155, -3635, 497, -35, 1},
    {18 375, 10 675, -26 225, 14 171, -3635, 497, -35, 1},
    {14 455, 12 579, -26 529, 14 187, -3635, 497, -35, 1},
    {28 175, 3955, -24 513, 13 979, -3627, 497, -35, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
1295 & 24\,371 & -30\,241 & 14\,683 & -3659 & 497 & -35 & 1 \\
2415 & 23\,987 & -30\,209 & 14\,683 & -3659 & 497 & -35 & 1 \\
-385 & 25\,507 & -30\,481 & 14\,699 & -3659 & 497 & -35 & 1 \\
735 & 25\,123 & -30\,449 & 14\,699 & -3659 & 497 & -35 & 1 \\
-2065 & 26\,643 & -30\,721 & 14\,715 & -3659 & 497 & -35 & 1 \\
9975 & 18\,035 & -28\,561 & 14\,491 & -3651 & 497 & -35 & 1 \\
11\,095 & 17\,651 & -28\,529 & 14\,491 & -3651 & 497 & -35 & 1 \\
7175 & 19\,555 & -28\,833 & 14\,507 & -3651 & 497 & -35 & 1 \\
8295 & 19\,171 & -28\,801 & 14\,507 & -3651 & 497 & -35 & 1 \\
9415 & 18\,787 & -28\,769 & 14\,507 & -3651 & 497 & -35 & 1 \\
4375 & 21\,075 & -29\,105 & 14\,523 & -3651 & 497 & -35 & 1 \\
5495 & 20\,691 & -29\,073 & 14\,523 & -3651 & 497 & -35 & 1 \\
6615 & 20\,307 & -29\,041 & 14\,523 & -3651 & 497 & -35 & 1 \\
2695 & 22\,211 & -29\,345 & 14\,539 & -3651 & 497 & -35 & 1 \\
3815 & 21\,827 & -29\,313 & 14\,539 & -3651 & 497 & -35 & 1 \\
16\,975 & 12\,835 & -27\,121 & 14\,315 & -3643 & 497 & -35 & 1 \\
14\,175 & 14\,355 & -27\,393 & 14\,331 & -3643 & 497 & -35 & 1 \\
15\,295 & 13\,971 & -27\,361 & 14\,331 & -3643 & 497 & -35 & 1 \\
11\,375 & 15\,875 & -27\,665 & 14\,347 & -3643 & 497 & -35 & 1 \\
12\,495 & 15\,491 & -27\,633 & 14\,347 & -3643 & 497 & -35 & 1 \\
13\,615 & 15\,107 & -27\,601 & 14\,347 & -3643 & 497 & -35 & 1 \\
8575 & 17\,395 & -27\,937 & 14\,363 & -3643 & 497 & -35 & 1 \\
23\,975 & 7635 & -25\,681 & 14\,139 & -3635 & 497 & -35 & 1 \\
21\,175 & 9155 & -25\,953 & 14\,155 & -3635 & 497 & -35 & 1 \\
18\,375 & 10\,675 & -26\,225 & 14\,171 & -3635 & 497 & -35 & 1 \\
14\,455 & 12\,579 & -26\,529 & 14\,187 & -3635 & 497 & -35 & 1 \\
28\,175 & 3955 & -24\,513 & 13\,979 & -3627 & 497 & -35 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-76\,245, 791\,111, -896\,845, 427\,535, -106\,151, 14\,413, -1015, 29\}$$

```
Array[c, 8].Transpose[A]
```

```
{1295 c[1] + 24 371 c[2] - 30 241 c[3] + 14 683 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 2415 c[1] + 23 987 c[2] - 30 209 c[3] + 14 683 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 -385 c[1] + 25 507 c[2] - 30 481 c[3] + 14 699 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 735 c[1] + 25 123 c[2] - 30 449 c[3] + 14 699 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 -2065 c[1] + 26 643 c[2] - 30 721 c[3] + 14 715 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 9975 c[1] + 18 035 c[2] - 28 561 c[3] + 14 491 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 11 095 c[1] + 17 651 c[2] - 28 529 c[3] +
  14 491 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 7175 c[1] + 19 555 c[2] - 28 833 c[3] + 14 507 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 8295 c[1] + 19 171 c[2] - 28 801 c[3] + 14 507 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 9415 c[1] + 18 787 c[2] - 28 769 c[3] + 14 507 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 4375 c[1] + 21 075 c[2] - 29 105 c[3] + 14 523 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 5495 c[1] + 20 691 c[2] - 29 073 c[3] + 14 523 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 6615 c[1] + 20 307 c[2] - 29 041 c[3] + 14 523 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 2695 c[1] + 22 211 c[2] - 29 345 c[3] + 14 539 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 3815 c[1] + 21 827 c[2] - 29 313 c[3] + 14 539 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 16 975 c[1] + 12 835 c[2] - 27 121 c[3] + 14 315 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8], 14 175 c[1] + 14 355 c[2] - 27 393 c[3] + 14 331 c[4] - 3643 c[5] +
  497 c[6] - 35 c[7] + c[8], 15 295 c[1] + 13 971 c[2] - 27 361 c[3] + 14 331 c[4] -
  3643 c[5] + 497 c[6] - 35 c[7] + c[8], 11 375 c[1] + 15 875 c[2] - 27 665 c[3] +
  14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8], 12 495 c[1] + 15 491 c[2] -
  27 633 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8], 13 615 c[1] +
  15 107 c[2] - 27 601 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 8575 c[1] + 17 395 c[2] - 27 937 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 23 975 c[1] + 7635 c[2] - 25 681 c[3] + 14 139 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 21 175 c[1] + 9155 c[2] - 25 953 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 18 375 c[1] + 10 675 c[2] - 26 225 c[3] + 14 171 c[4] -
  3635 c[5] + 497 c[6] - 35 c[7] + c[8], 14 455 c[1] + 12 579 c[2] -
  26 529 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 28 175 c[1] + 3955 c[2] - 24 513 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8]}
```

```
Array[c, 8].g
```

```
-76 245 c[1] + 791 111 c[2] - 896 845 c[3] +
 427 535 c[4] - 106 151 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8]
```

```
cert = Flatten[
  Array[c, 8] /. FindInstance[-76 245 c[1] + 791 111 c[2] - 896 845 c[3] + 427 535 c[4] -
       106 151 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8] < 0 &&
     1295 c[1] + 24 371 c[2] - 30 241 c[3] + 14 683 c[4] - 3659 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 2415 c[1] + 23 987 c[2] - 30 209 c[3] + 14 683 c[4] -
       3659 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 && -385 c[1] + 25 507 c[2] -
       30 481 c[3] + 14 699 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     735 c[1] + 25 123 c[2] - 30 449 c[3] + 14 699 c[4] - 3659 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && -2065 c[1] + 26 643 c[2] - 30 721 c[3] +
       14 715 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     9975 c[1] + 18 035 c[2] - 28 561 c[3] + 14 491 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 11 095 c[1] + 17 651 c[2] - 28 529 c[3] +
       14 491 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     7175 c[1] + 19 555 c[2] - 28 833 c[3] + 14 507 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 8295 c[1] + 19 171 c[2] - 28 801 c[3] +
       14 507 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     9415 c[1] + 18 787 c[2] - 28 769 c[3] + 14 507 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 4375 c[1] + 21 075 c[2] - 29 105 c[3] +
       14 523 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     5495 c[1] + 20 691 c[2] - 29 073 c[3] + 14 523 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 6615 c[1] + 20 307 c[2] - 29 041 c[3] +
       14 523 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     2695 c[1] + 22 211 c[2] - 29 345 c[3] + 14 539 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 3815 c[1] + 21 827 c[2] - 29 313 c[3] +
       14 539 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     16 975 c[1] + 12 835 c[2] - 27 121 c[3] + 14 315 c[4] - 3643 c[5] +
       497 c[6] - 35 c[7] + c[8] ≥ 0 && 14 175 c[1] + 14 355 c[2] -
       27 393 c[3] + 14 331 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     15 295 c[1] + 13 971 c[2] - 27 361 c[3] + 14 331 c[4] - 3643 c[5] +
       497 c[6] - 35 c[7] + c[8] ≥ 0 && 11 375 c[1] + 15 875 c[2] -
       27 665 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     12 495 c[1] + 15 491 c[2] - 27 633 c[3] + 14 347 c[4] - 3643 c[5] +
       497 c[6] - 35 c[7] + c[8] ≥ 0 && 13 615 c[1] + 15 107 c[2] -
       27 601 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     8575 c[1] + 17 395 c[2] - 27 937 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 23 975 c[1] + 7635 c[2] - 25 681 c[3] +
       14 139 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     21 175 c[1] + 9155 c[2] - 25 953 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 18 375 c[1] + 10 675 c[2] - 26 225 c[3] +
       14 171 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     14 455 c[1] + 12 579 c[2] - 26 529 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 28 175 c[1] + 3955 c[2] - 24 513 c[3] + 13 979 c[4] -
       3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0, Array[c, 8], Integers]]
{8, -1000, -7250, -51 880, -369 160, 0, 0, -783 400 120}
```

```
GCD[8, -1000, -7250, -51 880, -369 160, 0, 0, -783 400 120]
```

```
2
```

```
cert = cert / 2
```

```
{4, -500, -3625, -25 940, -184 580, 0, 0, -391 700 060}
```

```
Reverse[cert]
```

```
{-391 700 060, 0, 0, -184 580, -25 940, -3625, -500, 4}
```

```
cert.g
```

```
-1 005 415
```

```
cert.Transpose[A]
```

```
{244 445, 324 925, 124 685, 205 165, 4925, 861 005, 941 485, 660 765, 741 245, 821 725,
 460 525, 541 005, 621 485, 340 765, 421 245, 1 357 805, 1 157 565, 1 238 045, 957 325,
 1 037 805, 1 118 285, 757 085, 1 854 605, 1 654 365, 1 454 125, 1 173 405, 2 151 165}
```

```
chi = (-7 + x) (-5 + x)^8 (5 + x)^15 (-2616 + 3365 x - 1484 x^2 + 298 x^3 - 28 x^4 + x^5)
```

$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\left(-2616+3365\,x-1484\,x^{2}+298\,x^{3}-28\,x^{4}+x^{5}\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{37 975, -2765, -22 801, 13 787, -3619, 497, -35, 1},
 {1015, 23 347, -29 585, 14 555, -3651, 497, -35, 1},
 {-2905, 25 251, -29 889, 14 571, -3651, 497, -35, 1},
 {9695, 17 011, -27 905, 14 363, -3643, 497, -35, 1},
 {4655, 19 299, -28 241, 14 379, -3643, 497, -35, 1},
 {5775, 18 915, -28 209, 14 379, -3643, 497, -35, 1},
 {735, 21 203, -28 545, 14 395, -3643, 497, -35, 1},
 {1855, 20 819, -28 513, 14 395, -3643, 497, -35, 1},
 {-2065, 22 723, -28 817, 14 411, -3643, 497, -35, 1},
 {22 295, 8771, -25 921, 14 155, -3635, 497, -35, 1},
 {17 255, 11 059, -26 257, 14 171, -3635, 497, -35, 1},
 {18 375, 10 675, -26 225, 14 171, -3635, 497, -35, 1},
 {19 495, 10 291, -26 193, 14 171, -3635, 497, -35, 1},
 {14 455, 12 579, -26 529, 14 187, -3635, 497, -35, 1},
 {15 575, 12 195, -26 497, 14 187, -3635, 497, -35, 1},
 {10 535, 14 483, -26 833, 14 203, -3635, 497, -35, 1},
 {11 655, 14 099, -26 801, 14 203, -3635, 497, -35, 1},
 {30 975, 2435, -24 241, 13 963, -3627, 497, -35, 1},
 {27 055, 4339, -24 545, 13 979, -3627, 497, -35, 1},
 {28 175, 3955, -24 513, 13 979, -3627, 497, -35, 1},
 {29 295, 3571, -24 481, 13 979, -3627, 497, -35, 1},
 {24 255, 5859, -24 817, 13 995, -3627, 497, -35, 1},
 {25 375, 5475, -24 785, 13 995, -3627, 497, -35, 1},
 {20 335, 7763, -25 121, 14 011, -3627, 497, -35, 1},
 {43 575, -5805, -22 257, 13 755, -3619, 497, -35, 1},
 {40 775, -4285, -22 529, 13 771, -3619, 497, -35, 1},
 {36 855, -2381, -22 833, 13 787, -3619, 497, -35, 1},
 {34 055, -861, -23 105, 13 803, -3619, 497, -35, 1},
 {47 775, -9485, -21 089, 13 595, -3611, 497, -35, 1},
 {43 855, -7581, -21 393, 13 611, -3611, 497, -35, 1}}
```

```
A = {{1015, 23 347, -29 585, 14 555, -3651, 497, -35, 1},
    {-2905, 25 251, -29 889, 14 571, -3651, 497, -35, 1},
    {9695, 17 011, -27 905, 14 363, -3643, 497, -35, 1},
    {4655, 19 299, -28 241, 14 379, -3643, 497, -35, 1},
    {5775, 18 915, -28 209, 14 379, -3643, 497, -35, 1},
    {735, 21 203, -28 545, 14 395, -3643, 497, -35, 1},
    {1855, 20 819, -28 513, 14 395, -3643, 497, -35, 1},
    {-2065, 22 723, -28 817, 14 411, -3643, 497, -35, 1},
    {22 295, 8771, -25 921, 14 155, -3635, 497, -35, 1},
    {17 255, 11 059, -26 257, 14 171, -3635, 497, -35, 1},
    {18 375, 10 675, -26 225, 14 171, -3635, 497, -35, 1},
    {19 495, 10 291, -26 193, 14 171, -3635, 497, -35, 1},
    {14 455, 12 579, -26 529, 14 187, -3635, 497, -35, 1},
    {15 575, 12 195, -26 497, 14 187, -3635, 497, -35, 1},
    {10 535, 14 483, -26 833, 14 203, -3635, 497, -35, 1},
    {11 655, 14 099, -26 801, 14 203, -3635, 497, -35, 1},
    {30 975, 2435, -24 241, 13 963, -3627, 497, -35, 1},
    {27 055, 4339, -24 545, 13 979, -3627, 497, -35, 1},
    {28 175, 3955, -24 513, 13 979, -3627, 497, -35, 1},
    {29 295, 3571, -24 481, 13 979, -3627, 497, -35, 1},
    {24 255, 5859, -24 817, 13 995, -3627, 497, -35, 1},
    {25 375, 5475, -24 785, 13 995, -3627, 497, -35, 1},
    {20 335, 7763, -25 121, 14 011, -3627, 497, -35, 1},
    {43 575, -5805, -22 257, 13 755, -3619, 497, -35, 1},
    {40 775, -4285, -22 529, 13 771, -3619, 497, -35, 1},
    {36 855, -2381, -22 833, 13 787, -3619, 497, -35, 1},
    {37 975, -2765, -22 801, 13 787, -3619, 497, -35, 1},
    {34 055, -861, -23 105, 13 803, -3619, 497, -35, 1},
    {47 775, -9485, -21 089, 13 595, -3611, 497, -35, 1},
    {43 855, -7581, -21 393, 13 611, -3611, 497, -35, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
1015 & 23\,347 & -29\,585 & 14\,555 & -3651 & 497 & -35 & 1 \\
-2905 & 25\,251 & -29\,889 & 14\,571 & -3651 & 497 & -35 & 1 \\
9695 & 17\,011 & -27\,905 & 14\,363 & -3643 & 497 & -35 & 1 \\
4655 & 19\,299 & -28\,241 & 14\,379 & -3643 & 497 & -35 & 1 \\
5775 & 18\,915 & -28\,209 & 14\,379 & -3643 & 497 & -35 & 1 \\
735 & 21\,203 & -28\,545 & 14\,395 & -3643 & 497 & -35 & 1 \\
1855 & 20\,819 & -28\,513 & 14\,395 & -3643 & 497 & -35 & 1 \\
-2065 & 22\,723 & -28\,817 & 14\,411 & -3643 & 497 & -35 & 1 \\
22\,295 & 8771 & -25\,921 & 14\,155 & -3635 & 497 & -35 & 1 \\
17\,255 & 11\,059 & -26\,257 & 14\,171 & -3635 & 497 & -35 & 1 \\
18\,375 & 10\,675 & -26\,225 & 14\,171 & -3635 & 497 & -35 & 1 \\
19\,495 & 10\,291 & -26\,193 & 14\,171 & -3635 & 497 & -35 & 1 \\
14\,455 & 12\,579 & -26\,529 & 14\,187 & -3635 & 497 & -35 & 1 \\
15\,575 & 12\,195 & -26\,497 & 14\,187 & -3635 & 497 & -35 & 1 \\
10\,535 & 14\,483 & -26\,833 & 14\,203 & -3635 & 497 & -35 & 1 \\
11\,655 & 14\,099 & -26\,801 & 14\,203 & -3635 & 497 & -35 & 1 \\
30\,975 & 2435 & -24\,241 & 13\,963 & -3627 & 497 & -35 & 1 \\
27\,055 & 4339 & -24\,545 & 13\,979 & -3627 & 497 & -35 & 1 \\
28\,175 & 3955 & -24\,513 & 13\,979 & -3627 & 497 & -35 & 1 \\
29\,295 & 3571 & -24\,481 & 13\,979 & -3627 & 497 & -35 & 1 \\
24\,255 & 5859 & -24\,817 & 13\,995 & -3627 & 497 & -35 & 1 \\
25\,375 & 5475 & -24\,785 & 13\,995 & -3627 & 497 & -35 & 1 \\
20\,335 & 7763 & -25\,121 & 14\,011 & -3627 & 497 & -35 & 1 \\
43\,575 & -5805 & -22\,257 & 13\,755 & -3619 & 497 & -35 & 1 \\
40\,775 & -4285 & -22\,529 & 13\,771 & -3619 & 497 & -35 & 1 \\
36\,855 & -2381 & -22\,833 & 13\,787 & -3619 & 497 & -35 & 1 \\
37\,975 & -2765 & -22\,801 & 13\,787 & -3619 & 497 & -35 & 1 \\
34\,055 & -861 & -23\,105 & 13\,803 & -3619 & 497 & -35 & 1 \\
47\,775 & -9485 & -21\,089 & 13\,595 & -3611 & 497 & -35 & 1 \\
43\,855 & -7581 & -21\,393 & 13\,611 & -3611 & 497 & -35 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{13\,355, 649\,511, -841\,709, 419\,375, -105\,735, 14\,413, -1015, 29\}$$

```
Array[c, 8].Transpose[A]
```

```
{1015 c[1] + 23 347 c[2] - 29 585 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 -2905 c[1] + 25 251 c[2] - 29 889 c[3] + 14 571 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 9695 c[1] + 17 011 c[2] - 27 905 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 4655 c[1] + 19 299 c[2] - 28 241 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 5775 c[1] + 18 915 c[2] - 28 209 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 735 c[1] + 21 203 c[2] - 28 545 c[3] + 14 395 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 1855 c[1] + 20 819 c[2] - 28 513 c[3] + 14 395 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 -2065 c[1] + 22 723 c[2] - 28 817 c[3] + 14 411 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 22 295 c[1] + 8771 c[2] - 25 921 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 17 255 c[1] + 11 059 c[2] - 26 257 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] -
  35 c[7] + c[8], 18 375 c[1] + 10 675 c[2] - 26 225 c[3] + 14 171 c[4] -
  3635 c[5] + 497 c[6] - 35 c[7] + c[8], 19 495 c[1] + 10 291 c[2] -
  26 193 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8], 14 455 c[1] +
  12 579 c[2] - 26 529 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 15 575 c[1] + 12 195 c[2] - 26 497 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] -
  35 c[7] + c[8], 10 535 c[1] + 14 483 c[2] - 26 833 c[3] + 14 203 c[4] -
  3635 c[5] + 497 c[6] - 35 c[7] + c[8], 11 655 c[1] + 14 099 c[2] -
  26 801 c[3] + 14 203 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 30 975 c[1] + 2435 c[2] - 24 241 c[3] + 13 963 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 27 055 c[1] + 4339 c[2] - 24 545 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 28 175 c[1] + 3955 c[2] - 24 513 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 29 295 c[1] + 3571 c[2] - 24 481 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 24 255 c[1] + 5859 c[2] - 24 817 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 25 375 c[1] + 5475 c[2] - 24 785 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 20 335 c[1] + 7763 c[2] - 25 121 c[3] + 14 011 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 43 575 c[1] - 5805 c[2] - 22 257 c[3] + 13 755 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8],
 40 775 c[1] - 4285 c[2] - 22 529 c[3] + 13 771 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8],
 36 855 c[1] - 2381 c[2] - 22 833 c[3] + 13 787 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8],
 37 975 c[1] - 2765 c[2] - 22 801 c[3] + 13 787 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8],
 34 055 c[1] - 861 c[2] - 23 105 c[3] + 13 803 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8],
 47 775 c[1] - 9485 c[2] - 21 089 c[3] + 13 595 c[4] - 3611 c[5] + 497 c[6] - 35 c[7] + c[8],
 43 855 c[1] - 7581 c[2] - 21 393 c[3] + 13 611 c[4] - 3611 c[5] + 497 c[6] - 35 c[7] + c[8]}
```

```
Array[c, 8].g
```

```
13 355 c[1] + 649 511 c[2] - 841 709 c[3] +
 419 375 c[4] - 105 735 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8]
```

```
cert = Flatten[
  Array[c, 8] /. FindInstance[13 355 c[1] + 649 511 c[2] - 841 709 c[3] + 419 375 c[4] -
       105 735 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8] < 0 &&
     1015 c[1] + 23 347 c[2] - 29 585 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && -2905 c[1] + 25 251 c[2] - 29 889 c[3] + 14 571 c[4] -
       3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 && 9695 c[1] + 17 011 c[2] -
       27 905 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
     4655 c[1] + 19 299 c[2] - 28 241 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] -
       35 c[7] + c[8] ≥ 0 && 5775 c[1] + 18 915 c[2] - 28 209 c[3] +
```

```
    14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  735 c[1] + 21 203 c[2] - 28 545 c[3] + 14 395 c[4] - 3643 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 1855 c[1] + 20 819 c[2] - 28 513 c[3] +
    14 395 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
 -2065 c[1] + 22 723 c[2] - 28 817 c[3] + 14 411 c[4] - 3643 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 22 295 c[1] + 8771 c[2] - 25 921 c[3] +
    14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  17 255 c[1] + 11 059 c[2] - 26 257 c[3] + 14 171 c[4] - 3635 c[5] +
    497 c[6] - 35 c[7] + c[8] ≥ 0 && 18 375 c[1] + 10 675 c[2] -
    26 225 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  19 495 c[1] + 10 291 c[2] - 26 193 c[3] + 14 171 c[4] - 3635 c[5] +
    497 c[6] - 35 c[7] + c[8] ≥ 0 && 14 455 c[1] + 12 579 c[2] -
    26 529 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  15 575 c[1] + 12 195 c[2] - 26 497 c[3] + 14 187 c[4] - 3635 c[5] +
    497 c[6] - 35 c[7] + c[8] ≥ 0 && 10 535 c[1] + 14 483 c[2] -
    26 833 c[3] + 14 203 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  11 655 c[1] + 14 099 c[2] - 26 801 c[3] + 14 203 c[4] - 3635 c[5] +
    497 c[6] - 35 c[7] + c[8] ≥ 0 && 30 975 c[1] + 2435 c[2] -
    24 241 c[3] + 13 963 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  27 055 c[1] + 4339 c[2] - 24 545 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 28 175 c[1] + 3955 c[2] - 24 513 c[3] +
    13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  29 295 c[1] + 3571 c[2] - 24 481 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 24 255 c[1] + 5859 c[2] - 24 817 c[3] +
    13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  25 375 c[1] + 5475 c[2] - 24 785 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 20 335 c[1] + 7763 c[2] - 25 121 c[3] +
    14 011 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  43 575 c[1] - 5805 c[2] - 22 257 c[3] + 13 755 c[4] - 3619 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 40 775 c[1] - 4285 c[2] - 22 529 c[3] +
    13 771 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  36 855 c[1] - 2381 c[2] - 22 833 c[3] + 13 787 c[4] - 3619 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 37 975 c[1] - 2765 c[2] - 22 801 c[3] +
    13 787 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  34 055 c[1] - 861 c[2] - 23 105 c[3] + 13 803 c[4] - 3619 c[5] + 497 c[6] -
    35 c[7] + c[8] ≥ 0 && 47 775 c[1] - 9485 c[2] - 21 089 c[3] +
    13 595 c[4] - 3611 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
  43 855 c[1] - 7581 c[2] - 21 393 c[3] + 13 611 c[4] - 3611 c[5] +
    497 c[6] - 35 c[7] + c[8] ≥ 0, Array[c, 8], Integers]]
{0, 2250, 25 343, 212 711, 1 568 930, 0, 0, 3 329 450 510}

GCD[0, 2250, 25 343, 212 711, 1 568 930, 0, 0, 3 329 450 510]
1

Reverse[cert]
{3 329 450 510, 0, 0, 1 568 930, 212 711, 25 343, 2250, 0}
```

```
cert.g
```

```
-1 104 572
```

```
cert.Transpose[A]
```

```
{53 780, 36 884, 84 948, 121 076, 68 052, 104 180, 51 156, 34 260, 133 012, 169 140,
 116 116, 63 092, 99 220, 46 196, 82 324, 29 300, 164 180, 147 284, 94 260, 41 236,
 77 364, 24 340, 60 468, 212 244, 142 324, 125 428, 72 404, 55 508, 50 548, 33 652}
```

```
chi = (-7 + x) (-5 + x)^8 (5 + x)^15 (17 - 10 x + x^2) (-176 + 101 x - 18 x^2 + x^3)
```

$$(-7+x)\,(-5+x)^{8}\,(5+x)^{15}\,\left(17-10\,x+x^{2}\right)\,\left(-176+101\,x-18\,x^{2}+x^{3}\right)$$

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
```

```
{{-6097, 29235, -31233, 14747, -3659, 497, -35, 1},
 {-6545, 29299, -31233, 14747, -3659, 497, -35, 1},
 {3495, 21891, -29313, 14539, -3651, 497, -35, 1},
 {-425, 23795, -29617, 14555, -3651, 497, -35, 1},
 {1463, 23283, -29585, 14555, -3651, 497, -35, 1},
 {1015, 23347, -29585, 14555, -3651, 497, -35, 1},
 {2135, 22963, -29553, 14555, -3651, 497, -35, 1},
 {-1337, 24803, -29857, 14571, -3651, 497, -35, 1},
 {-1785, 24867, -29857, 14571, -3651, 497, -35, 1},
 {12175, 15555, -27633, 14347, -3643, 497, -35, 1},
 {13615, 15107, -27601, 14347, -3643, 497, -35, 1},
 {8575, 17395, -27937, 14363, -3643, 497, -35, 1},
 {8255, 17459, -27937, 14363, -3643, 497, -35, 1},
 {9695, 17011, -27905, 14363, -3643, 497, -35, 1},
 {10815, 16627, -27873, 14363, -3643, 497, -35, 1},
 {4655, 19299, -28241, 14379, -3643, 497, -35, 1},
 {5775, 18915, -28209, 14379, -3643, 497, -35, 1},
 {7343, 18467, -28177, 14379, -3643, 497, -35, 1},
 {6895, 18531, -28177, 14379, -3643, 497, -35, 1},
 {8463, 18083, -28145, 14379, -3643, 497, -35, 1},
 {2975, 20435, -28481, 14395, -3643, 497, -35, 1},
 {21175, 9155, -25953, 14155, -3635, 497, -35, 1},
 {21975, 8835, -25921, 14155, -3635, 497, -35, 1},
 {17255, 11059, -26257, 14171, -3635, 497, -35, 1},
 {18375, 10675, -26225, 14171, -3635, 497, -35, 1},
 {19495, 10291, -26193, 14171, -3635, 497, -35, 1},
 {14455, 12579, -26529, 14187, -3635, 497, -35, 1},
 {15575, 12195, -26497, 14187, -3635, 497, -35, 1},
 {10535, 14483, -26833, 14203, -3635, 497, -35, 1},
 {11655, 14099, -26801, 14203, -3635, 497, -35, 1},
 {7735, 16003, -27105, 14219, -3635, 497, -35, 1},
 {27055, 4339, -24545, 13979, -3627, 497, -35, 1},
 {28175, 3955, -24513, 13979, -3627, 497, -35, 1},
 {24255, 5859, -24817, 13995, -3627, 497, -35, 1},
 {25375, 5475, -24785, 13995, -3627, 497, -35, 1},
 {34055, -861, -23105, 13803, -3619, 497, -35, 1}}
```

```
A = {{-6097, 29235, -31233, 14747, -3659, 497, -35, 1},
    {-6545, 29299, -31233, 14747, -3659, 497, -35, 1},
    {3495, 21891, -29313, 14539, -3651, 497, -35, 1},
    {-425, 23795, -29617, 14555, -3651, 497, -35, 1},
    {1463, 23283, -29585, 14555, -3651, 497, -35, 1},
    {1015, 23347, -29585, 14555, -3651, 497, -35, 1},
    {2135, 22963, -29553, 14555, -3651, 497, -35, 1},
    {-1337, 24803, -29857, 14571, -3651, 497, -35, 1},
    {-1785, 24867, -29857, 14571, -3651, 497, -35, 1},
    {12175, 15555, -27633, 14347, -3643, 497, -35, 1},
    {13615, 15107, -27601, 14347, -3643, 497, -35, 1},
    {8575, 17395, -27937, 14363, -3643, 497, -35, 1},
    {8255, 17459, -27937, 14363, -3643, 497, -35, 1},
    {9695, 17011, -27905, 14363, -3643, 497, -35, 1},
    {10815, 16627, -27873, 14363, -3643, 497, -35, 1},
    {4655, 19299, -28241, 14379, -3643, 497, -35, 1},
    {5775, 18915, -28209, 14379, -3643, 497, -35, 1},
    {7343, 18467, -28177, 14379, -3643, 497, -35, 1},
    {6895, 18531, -28177, 14379, -3643, 497, -35, 1},
    {8463, 18083, -28145, 14379, -3643, 497, -35, 1},
    {2975, 20435, -28481, 14395, -3643, 497, -35, 1},
    {21175, 9155, -25953, 14155, -3635, 497, -35, 1},
    {21975, 8835, -25921, 14155, -3635, 497, -35, 1},
    {17255, 11059, -26257, 14171, -3635, 497, -35, 1},
    {18375, 10675, -26225, 14171, -3635, 497, -35, 1},
    {19495, 10291, -26193, 14171, -3635, 497, -35, 1},
    {14455, 12579, -26529, 14187, -3635, 497, -35, 1},
    {15575, 12195, -26497, 14187, -3635, 497, -35, 1},
    {10535, 14483, -26833, 14203, -3635, 497, -35, 1},
    {11655, 14099, -26801, 14203, -3635, 497, -35, 1},
    {7735, 16003, -27105, 14219, -3635, 497, -35, 1},
    {27055, 4339, -24545, 13979, -3627, 497, -35, 1},
    {28175, 3955, -24513, 13979, -3627, 497, -35, 1},
    {24255, 5859, -24817, 13995, -3627, 497, -35, 1},
    {25375, 5475, -24785, 13995, -3627, 497, -35, 1},
    {34055, -861, -23105, 13803, -3619, 497, -35, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
-6097 & 29\,235 & -31\,233 & 14\,747 & -3659 & 497 & -35 & 1 \\
-6545 & 29\,299 & -31\,233 & 14\,747 & -3659 & 497 & -35 & 1 \\
3495 & 21\,891 & -29\,313 & 14\,539 & -3651 & 497 & -35 & 1 \\
-425 & 23\,795 & -29\,617 & 14\,555 & -3651 & 497 & -35 & 1 \\
1463 & 23\,283 & -29\,585 & 14\,555 & -3651 & 497 & -35 & 1 \\
1015 & 23\,347 & -29\,585 & 14\,555 & -3651 & 497 & -35 & 1 \\
2135 & 22\,963 & -29\,553 & 14\,555 & -3651 & 497 & -35 & 1 \\
-1337 & 24\,803 & -29\,857 & 14\,571 & -3651 & 497 & -35 & 1 \\
-1785 & 24\,867 & -29\,857 & 14\,571 & -3651 & 497 & -35 & 1 \\
12\,175 & 15\,555 & -27\,633 & 14\,347 & -3643 & 497 & -35 & 1 \\
13\,615 & 15\,107 & -27\,601 & 14\,347 & -3643 & 497 & -35 & 1 \\
8575 & 17\,395 & -27\,937 & 14\,363 & -3643 & 497 & -35 & 1 \\
8255 & 17\,459 & -27\,937 & 14\,363 & -3643 & 497 & -35 & 1 \\
9695 & 17\,011 & -27\,905 & 14\,363 & -3643 & 497 & -35 & 1 \\
10\,815 & 16\,627 & -27\,873 & 14\,363 & -3643 & 497 & -35 & 1 \\
4655 & 19\,299 & -28\,241 & 14\,379 & -3643 & 497 & -35 & 1 \\
5775 & 18\,915 & -28\,209 & 14\,379 & -3643 & 497 & -35 & 1 \\
7343 & 18\,467 & -28\,177 & 14\,379 & -3643 & 497 & -35 & 1 \\
6895 & 18\,531 & -28\,177 & 14\,379 & -3643 & 497 & -35 & 1 \\
8463 & 18\,083 & -28\,145 & 14\,379 & -3643 & 497 & -35 & 1 \\
2975 & 20\,435 & -28\,481 & 14\,395 & -3643 & 497 & -35 & 1 \\
21\,175 & 9155 & -25\,953 & 14\,155 & -3635 & 497 & -35 & 1 \\
21\,975 & 8835 & -25\,921 & 14\,155 & -3635 & 497 & -35 & 1 \\
17\,255 & 11\,059 & -26\,257 & 14\,171 & -3635 & 497 & -35 & 1 \\
18\,375 & 10\,675 & -26\,225 & 14\,171 & -3635 & 497 & -35 & 1 \\
19\,495 & 10\,291 & -26\,193 & 14\,171 & -3635 & 497 & -35 & 1 \\
14\,455 & 12\,579 & -26\,529 & 14\,187 & -3635 & 497 & -35 & 1 \\
15\,575 & 12\,195 & -26\,497 & 14\,187 & -3635 & 497 & -35 & 1 \\
10\,535 & 14\,483 & -26\,833 & 14\,203 & -3635 & 497 & -35 & 1 \\
11\,655 & 14\,099 & -26\,801 & 14\,203 & -3635 & 497 & -35 & 1 \\
7735 & 16\,003 & -27\,105 & 14\,219 & -3635 & 497 & -35 & 1 \\
27\,055 & 4339 & -24\,545 & 13\,979 & -3627 & 497 & -35 & 1 \\
28\,175 & 3955 & -24\,513 & 13\,979 & -3627 & 497 & -35 & 1 \\
24\,255 & 5859 & -24\,817 & 13\,995 & -3627 & 497 & -35 & 1 \\
25\,375 & 5475 & -24\,785 & 13\,995 & -3627 & 497 & -35 & 1 \\
34\,055 & -861 & -23\,105 & 13\,803 & -3619 & 497 & -35 & 1
\end{pmatrix}$$

```
g = CoefficientList[D[chi, x] / mu[chi] // Factor, x]
```

$$\{-49\,765,\ 742\,247,\ -874\,829,\ 423\,855,\ -105\,943,\ 14\,413,\ -1015,\ 29\}$$

```
Array[c, 8].Transpose[A]
```

```
{-6097 c[1] + 29 235 c[2] - 31 233 c[3] + 14 747 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 -6545 c[1] + 29 299 c[2] - 31 233 c[3] + 14 747 c[4] - 3659 c[5] + 497 c[6] - 35 c[7] + c[8],
 3495 c[1] + 21 891 c[2] - 29 313 c[3] + 14 539 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 -425 c[1] + 23 795 c[2] - 29 617 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 1463 c[1] + 23 283 c[2] - 29 585 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 1015 c[1] + 23 347 c[2] - 29 585 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 2135 c[1] + 22 963 c[2] - 29 553 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 -1337 c[1] + 24 803 c[2] - 29 857 c[3] + 14 571 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 -1785 c[1] + 24 867 c[2] - 29 857 c[3] + 14 571 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8],
 12 175 c[1] + 15 555 c[2] - 27 633 c[3] + 14 347 c[4] -
  3643 c[5] + 497 c[6] - 35 c[7] + c[8], 13 615 c[1] + 15 107 c[2] -
  27 601 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 8575 c[1] + 17 395 c[2] - 27 937 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 8255 c[1] + 17 459 c[2] - 27 937 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 9695 c[1] + 17 011 c[2] - 27 905 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 10 815 c[1] + 16 627 c[2] - 27 873 c[3] +
  14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 4655 c[1] + 19 299 c[2] - 28 241 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 5775 c[1] + 18 915 c[2] - 28 209 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 7343 c[1] + 18 467 c[2] - 28 177 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 6895 c[1] + 18 531 c[2] - 28 177 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 8463 c[1] + 18 083 c[2] - 28 145 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 2975 c[1] + 20 435 c[2] - 28 481 c[3] + 14 395 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8],
 21 175 c[1] + 9155 c[2] - 25 953 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 21 975 c[1] + 8835 c[2] - 25 921 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 17 255 c[1] + 11 059 c[2] - 26 257 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] +
  c[8], 18 375 c[1] + 10 675 c[2] - 26 225 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] -
  35 c[7] + c[8], 19 495 c[1] + 10 291 c[2] - 26 193 c[3] + 14 171 c[4] - 3635 c[5] +
  497 c[6] - 35 c[7] + c[8], 14 455 c[1] + 12 579 c[2] - 26 529 c[3] + 14 187 c[4] -
  3635 c[5] + 497 c[6] - 35 c[7] + c[8], 15 575 c[1] + 12 195 c[2] - 26 497 c[3] +
  14 187 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8], 10 535 c[1] + 14 483 c[2] -
  26 833 c[3] + 14 203 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8], 11 655 c[1] +
  14 099 c[2] - 26 801 c[3] + 14 203 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 7735 c[1] + 16 003 c[2] - 27 105 c[3] + 14 219 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8],
 27 055 c[1] + 4339 c[2] - 24 545 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 28 175 c[1] + 3955 c[2] - 24 513 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 24 255 c[1] + 5859 c[2] - 24 817 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 25 375 c[1] + 5475 c[2] - 24 785 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8],
 34 055 c[1] - 861 c[2] - 23 105 c[3] + 13 803 c[4] - 3619 c[5] + 497 c[6] - 35 c[7] + c[8]}
```

```
Array[c, 8].g
```

```
-49 765 c[1] + 742 247 c[2] - 874 829 c[3] +
 423 855 c[4] - 105 943 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8]
```

```
cert = Flatten[
  Array[c, 8] /. FindInstance[-49 765 c[1] + 742 247 c[2] - 874 829 c[3] + 423 855 c[4] -
```

```
  105 943 c[5] + 14 413 c[6] - 1015 c[7] + 29 c[8] < 0 &&
-6097 c[1] + 29 235 c[2] - 31 233 c[3] + 14 747 c[4] - 3659 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && -6545 c[1] + 29 299 c[2] - 31 233 c[3] + 14 747 c[4] -
  3659 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 && 3495 c[1] + 21 891 c[2] -
  29 313 c[3] + 14 539 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
-425 c[1] + 23 795 c[2] - 29 617 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 1463 c[1] + 23 283 c[2] - 29 585 c[3] +
  14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
1015 c[1] + 23 347 c[2] - 29 585 c[3] + 14 555 c[4] - 3651 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 2135 c[1] + 22 963 c[2] - 29 553 c[3] +
  14 555 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
-1337 c[1] + 24 803 c[2] - 29 857 c[3] + 14 571 c[4] - 3651 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && -1785 c[1] + 24 867 c[2] -
  29 857 c[3] + 14 571 c[4] - 3651 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
12 175 c[1] + 15 555 c[2] - 27 633 c[3] + 14 347 c[4] - 3643 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && 13 615 c[1] + 15 107 c[2] -
  27 601 c[3] + 14 347 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
8575 c[1] + 17 395 c[2] - 27 937 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 8255 c[1] + 17 459 c[2] - 27 937 c[3] +
  14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
9695 c[1] + 17 011 c[2] - 27 905 c[3] + 14 363 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 10 815 c[1] + 16 627 c[2] - 27 873 c[3] +
  14 363 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
4655 c[1] + 19 299 c[2] - 28 241 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 5775 c[1] + 18 915 c[2] - 28 209 c[3] +
  14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
7343 c[1] + 18 467 c[2] - 28 177 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 6895 c[1] + 18 531 c[2] - 28 177 c[3] +
  14 379 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
8463 c[1] + 18 083 c[2] - 28 145 c[3] + 14 379 c[4] - 3643 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 2975 c[1] + 20 435 c[2] - 28 481 c[3] +
  14 395 c[4] - 3643 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
21 175 c[1] + 9155 c[2] - 25 953 c[3] + 14 155 c[4] - 3635 c[5] + 497 c[6] -
  35 c[7] + c[8] ≥ 0 && 21 975 c[1] + 8835 c[2] - 25 921 c[3] +
  14 155 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
17 255 c[1] + 11 059 c[2] - 26 257 c[3] + 14 171 c[4] - 3635 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && 18 375 c[1] + 10 675 c[2] -
  26 225 c[3] + 14 171 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
19 495 c[1] + 10 291 c[2] - 26 193 c[3] + 14 171 c[4] - 3635 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && 14 455 c[1] + 12 579 c[2] -
  26 529 c[3] + 14 187 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
15 575 c[1] + 12 195 c[2] - 26 497 c[3] + 14 187 c[4] - 3635 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && 10 535 c[1] + 14 483 c[2] -
  26 833 c[3] + 14 203 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
11 655 c[1] + 14 099 c[2] - 26 801 c[3] + 14 203 c[4] - 3635 c[5] +
  497 c[6] - 35 c[7] + c[8] ≥ 0 && 7735 c[1] + 16 003 c[2] -
  27 105 c[3] + 14 219 c[4] - 3635 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
```

```
    27 055 c[1] + 4339 c[2] - 24 545 c[3] + 13 979 c[4] - 3627 c[5] + 497 c[6] -
      35 c[7] + c[8] ≥ 0 && 28 175 c[1] + 3955 c[2] - 24 513 c[3] +
      13 979 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
    24 255 c[1] + 5859 c[2] - 24 817 c[3] + 13 995 c[4] - 3627 c[5] + 497 c[6] -
      35 c[7] + c[8] ≥ 0 && 25 375 c[1] + 5475 c[2] - 24 785 c[3] +
      13 995 c[4] - 3627 c[5] + 497 c[6] - 35 c[7] + c[8] ≥ 0 &&
    34 055 c[1] - 861 c[2] - 23 105 c[3] + 13 803 c[4] - 3619 c[5] +
      497 c[6] - 35 c[7] + c[8] ≥ 0, Array[c, 8], Integers]]
```

```
{-2001, -7066, -19 411, -27 929, 0, 0, 0, 0}
```

```
GCD[-2001, -7066, -19 411, -27 929, 0, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, 0, -27 929, -19 411, -7066, -2001}
```

```
cert.g
```

```
-1 678 113
```

```
cert.Transpose[A]
```

```
{20 387, 464 611, 1 259 611, 1 103 947, 322 699, 766 923, 617 995, 18 107, 462 331,
 1 412 995, 1 075 971, 1 069 235, 1 257 331, 920 307, 771 379, 913 571, 764 643, 171 491,
 615 715, 22 563, 460 051, 1 378 283, 1 417 451, 1 222 619, 1 073 691, 924 763, 918 027,
 769 099, 762 363, 613 435, 457 771, 1 227 075, 1 078 147, 922 483, 773 555, 926 939}
```