```
In[•]:= dim14last6 = {(-7 + x)^2 (-5 + x)^10 (5 + x)^15 (16 - 11 x + x^2),
    (-7 + x)^2 (-5 + x)^9 (-3 + x) (5 + x)^15 (32 - 13 x + x^2),
    (-7 + x) (-5 + x)^10 (5 + x)^15 (-128 + 93 x - 18 x^2 + x^3),
    (-5 + x)^11 (-3 + x) (5 + x)^15 (68 - 17 x + x^2), (-7 + x)^2 (-5 + x)^8 (-3 + x)^2
     (5 + x)^15 (52 - 15 x + x^2), (-9 + x)^2 (-5 + x)^10 (-4 + x) (-3 + x) (5 + x)^15};
```

```
In[•]:= chi = (-7 + x)^2 (-5 + x)^10 (5 + x)^15 (16 - 11 x + x^2)
Out[•]= (-7 + x)^2 (-5 + x)^10 (5 + x)^15 (16 - 11 x + x^2)
```

```
CoefficientList[feasibleinterlacingpolylist[chi], x]
{{-225, -110, 96, -18, 1}, {-209, -110, 96, -18, 1},
 {-193, -110, 96, -18, 1}, {-177, -110, 96, -18, 1},
 {-161, -110, 96, -18, 1}, {-217, -102, 96, -18, 1}, {-345, -86, 96, -18, 1},
 {-329, -86, 96, -18, 1}, {-265, -102, 96, -18, 1}, {-249, -102, 96, -18, 1},
 {-233, -102, 96, -18, 1}, {31, -142, 96, -18, 1}, {-41, -134, 96, -18, 1},
 {-25, -134, 96, -18, 1}, {-9, -134, 96, -18, 1}, {7, -134, 96, -18, 1},
 {-113, -126, 96, -18, 1}, {-97, -126, 96, -18, 1}, {-81, -126, 96, -18, 1},
 {-65, -126, 96, -18, 1}, {-49, -126, 96, -18, 1}, {-185, -118, 96, -18, 1},
 {-169, -118, 96, -18, 1}, {-153, -118, 96, -18, 1}, {-137, -118, 96, -18, 1},
 {-121, -118, 96, -18, 1}, {-105, -118, 96, -18, 1}, {-305, -94, 96, -18, 1},
 {-289, -94, 96, -18, 1}, {-273, -94, 96, -18, 1}, {-385, -78, 96, -18, 1}}
```

```
A = {{31, -142, 96, -18, 1}, {-41, -134, 96, -18, 1},
    {-25, -134, 96, -18, 1}, {-9, -134, 96, -18, 1}, {7, -134, 96, -18, 1},
    {-113, -126, 96, -18, 1}, {-97, -126, 96, -18, 1}, {-81, -126, 96, -18, 1},
    {-65, -126, 96, -18, 1}, {-49, -126, 96, -18, 1}, {-185, -118, 96, -18, 1},
    {-169, -118, 96, -18, 1}, {-153, -118, 96, -18, 1},
    {-137, -118, 96, -18, 1}, {-121, -118, 96, -18, 1}, {-105, -118, 96, -18, 1},
    {-225, -110, 96, -18, 1}, {-209, -110, 96, -18, 1}, {-193, -110, 96, -18, 1},
    {-177, -110, 96, -18, 1}, {-161, -110, 96, -18, 1}, {-265, -102, 96, -18, 1},
    {-249, -102, 96, -18, 1}, {-233, -102, 96, -18, 1}, {-217, -102, 96, -18, 1},
    {-305, -94, 96, -18, 1}, {-289, -94, 96, -18, 1}, {-273, -94, 96, -18, 1},
    {-345, -86, 96, -18, 1}, {-329, -86, 96, -18, 1}, {-385, -78, 96, -18, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 31 & -142 & 96 & -18 & 1 \\ -41 & -134 & 96 & -18 & 1 \\ -25 & -134 & 96 & -18 & 1 \\ -9 & -134 & 96 & -18 & 1 \\ 7 & -134 & 96 & -18 & 1 \\ -113 & -126 & 96 & -18 & 1 \\ -97 & -126 & 96 & -18 & 1 \\ -81 & -126 & 96 & -18 & 1 \\ -65 & -126 & 96 & -18 & 1 \\ -49 & -126 & 96 & -18 & 1 \\ -185 & -118 & 96 & -18 & 1 \\ -169 & -118 & 96 & -18 & 1 \\ -153 & -118 & 96 & -18 & 1 \\ -137 & -118 & 96 & -18 & 1 \\ -121 & -118 & 96 & -18 & 1 \\ -105 & -118 & 96 & -18 & 1 \\ -225 & -110 & 96 & -18 & 1 \\ -209 & -110 & 96 & -18 & 1 \\ -193 & -110 & 96 & -18 & 1 \\ -177 & -110 & 96 & -18 & 1 \\ -161 & -110 & 96 & -18 & 1 \\ -265 & -102 & 96 & -18 & 1 \\ -249 & -102 & 96 & -18 & 1 \\ -233 & -102 & 96 & -18 & 1 \\ -217 & -102 & 96 & -18 & 1 \\ -305 & -94 & 96 & -18 & 1 \\ -289 & -94 & 96 & -18 & 1 \\ -273 & -94 & 96 & -18 & 1 \\ -345 & -86 & 96 & -18 & 1 \\ -329 & -86 & 96 & -18 & 1 \\ -385 & -78 & 96 & -18 & 1 \end{pmatrix}$$

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

```
{75, -3950, 2784, -522, 29}
```

```
FindInstance[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 &&
  n[6] ≥ 0 && n[7] ≥ 0 && n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 &&
  n[12] ≥ 0 && n[13] ≥ 0 && n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && n[17] ≥ 0 &&
  n[18] ≥ 0 && n[19] ≥ 0 && n[20] ≥ 0 && n[21] ≥ 0 && n[22] ≥ 0 && n[23] ≥ 0 &&
  n[24] ≥ 0 && n[25] ≥ 0 && n[26] ≥ 0 && n[27] ≥ 0 && n[28] ≥ 0 && n[29] ≥ 0 &&
  n[30] ≥ 0 && n[31] ≥ 0 && Array[n, 31].A == g, Array[n, 31], Integers]
```

```
{{n[1] → 18, n[2] → 0, n[3] → 0, n[4] → 0, n[5] → 9, n[6] → 0,
  n[7] → 0, n[8] → 0, n[9] → 0, n[10] → 0, n[11] → 0, n[12] → 0, n[13] → 0,
  n[14] → 0, n[15] → 0, n[16] → 0, n[17] → 0, n[18] → 0, n[19] → 0,
  n[20] → 0, n[21] → 0, n[22] → 0, n[23] → 0, n[24] → 0, n[25] → 0,
  n[26] → 0, n[27] → 0, n[28] → 2, n[29] → 0, n[30] → 0, n[31] → 0}}
```

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

```
{31 c[1] - 142 c[2] + 96 c[3] - 18 c[4] + c[5],
 -41 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5],
 -25 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5],
 -9 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5], 7 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5],
 -113 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5],
 -97 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5],
 -81 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5],
 -65 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5],
 -49 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5],
 -185 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -169 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -153 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -137 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -121 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -105 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5],
 -225 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5],
 -209 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5],
 -193 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5],
 -177 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5],
 -161 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5],
 -265 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5],
 -249 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5],
 -233 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5],
 -217 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5],
 -305 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5],
 -289 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5],
 -273 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5],
 -345 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5],
 -329 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5],
 -385 c[1] - 78 c[2] + 96 c[3] - 18 c[4] + c[5]}
```

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

```
75 c[1] - 3950 c[2] + 2784 c[3] - 522 c[4] + 29 c[5]
```

```
warrant1 = Flatten[
  Array[c, 5] /. FindInstance[75 c[1] - 3950 c[2] + 2784 c[3] - 522 c[4] + 29 c[5] < 0 &&
     31 c[1] - 142 c[2] + 96 c[3] - 18 c[4] + c[5] < 0 &&
     -41 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -25 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -9 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     7 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -113 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -97 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -81 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -65 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -49 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -185 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -169 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -153 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -137 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -121 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -105 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -225 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -209 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -193 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -177 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -161 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -265 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -249 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -233 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -217 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -305 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -289 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -273 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -345 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -329 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -385 c[1] - 78 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
{0, 116, 0, 0, 15744}

GCD[0, 116, 0, 0, 15744]
4

warrant1 = warrant1 / 4
{0, 29, 0, 0, 3936}

Reverse[warrant1]
{3936, 0, 0, 29, 0}

warrant1.g
-406
```

```
warrant1.Transpose[A]
```

```
{-182, 50, 50, 50, 50, 282, 282, 282, 282, 282, 514, 514, 514, 514, 514, 514, 746,
 746, 746, 746, 746, 978, 978, 978, 978, 1210, 1210, 1210, 1442, 1442, 1674}
```

```
warrant2 = Flatten[
  Array[c, 5] /. FindInstance[75 c[1] - 3950 c[2] + 2784 c[3] - 522 c[4] + 29 c[5] < 0 &&
     31 c[1] - 142 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -41 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -25 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -9 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     7 c[1] - 134 c[2] + 96 c[3] - 18 c[4] + c[5] < 0 &&
     -113 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -97 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -81 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -65 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -49 c[1] - 126 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -185 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -169 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -153 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -137 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -121 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -105 c[1] - 118 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -225 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -209 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -193 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -177 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -161 c[1] - 110 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -265 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -249 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -233 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -217 c[1] - 102 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -305 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -289 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -273 c[1] - 94 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -345 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -329 c[1] - 86 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0 &&
     -385 c[1] - 78 c[2] + 96 c[3] - 18 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{-492, -2459, 0, 0, -333 696}
```

```
GCD[-492, -2459, 0, 0, -333 696]
```

```
1
```

```
Reverse[warrant2]
```

```
{-333 696, 0, 0, -2459, -492}
```

warrant2.g

$$-1034$$

warrant2.Transpose[A]

$$\{230, 15982, 8110, 238, -7634, 31734, 23862, 15990, 8118, 246, 47486,$$
$$39614, 31742, 23870, 15998, 8126, 47494, 39622, 31750, 23878, 16006,$$
$$47502, 39630, 31758, 23886, 47510, 39638, 31766, 47518, 39646, 47526\}$$

feasibleinterlacingpolylist[chi]

$$\{(-9+x)(-5+x)^2(1+x), -209-110x+96x^2-18x^3+x^4,$$
$$-193-110x+96x^2-18x^3+x^4, -177-110x+96x^2-18x^3+x^4,$$
$$(-7+x)(23+19x-11x^2+x^3), (-7+x)(1+x)(31-12x+x^2),$$
$$(-5+x)(69+31x-13x^2+x^3), (-7+x)(47+19x-11x^2+x^3),$$
$$(-5+x)(53+31x-13x^2+x^3), -249-102x+96x^2-18x^3+x^4,$$
$$-233-102x+96x^2-18x^3+x^4, 31-142x+96x^2-18x^3+x^4,$$
$$-41-134x+96x^2-18x^3+x^4, -25-134x+96x^2-18x^3+x^4, (-9+x)(1+15x-9x^2+x^3),$$
$$(-7+x)(-1+19x-11x^2+x^3), -113-126x+96x^2-18x^3+x^4,$$
$$-97-126x+96x^2-18x^3+x^4, (-9+x)(-3+x)(-3-6x+x^2),$$
$$-65-126x+96x^2-18x^3+x^4, (-7+x)(7+19x-11x^2+x^3),$$
$$(-5+x)(37+31x-13x^2+x^3), -169-118x+96x^2-18x^3+x^4,$$
$$(-9+x)(17+15x-9x^2+x^3), -137-118x+96x^2-18x^3+x^4,$$
$$-121-118x+96x^2-18x^3+x^4, (-7+x)(-3+x)(-5-8x+x^2),$$
$$(-5+x)(61+31x-13x^2+x^3), -289-94x+96x^2-18x^3+x^4,$$
$$(-7+x)(39+19x-11x^2+x^3), (-7+x)(-5+x)(-11-6x+x^2)\}$$

In[•]:=
```
list = {(-9 + x) (-5 + x)^2 (1 + x),
    -209 - 110 x + 96 x^2 - 18 x^3 + x^4, -193 - 110 x + 96 x^2 - 18 x^3 + x^4,
    -177 - 110 x + 96 x^2 - 18 x^3 + x^4, (-7 + x) (23 + 19 x - 11 x^2 + x^3),
    (-7 + x) (1 + x) (31 - 12 x + x^2), (-5 + x) (69 + 31 x - 13 x^2 + x^3),
    (-7 + x) (47 + 19 x - 11 x^2 + x^3), (-5 + x) (53 + 31 x - 13 x^2 + x^3),
    -249 - 102 x + 96 x^2 - 18 x^3 + x^4, -233 - 102 x + 96 x^2 - 18 x^3 + x^4,
    31 - 142 x + 96 x^2 - 18 x^3 + x^4, -41 - 134 x + 96 x^2 - 18 x^3 + x^4,
    -25 - 134 x + 96 x^2 - 18 x^3 + x^4, (-9 + x) (1 + 15 x - 9 x^2 + x^3),
    (-7 + x) (-1 + 19 x - 11 x^2 + x^3), -113 - 126 x + 96 x^2 - 18 x^3 + x^4,
    -97 - 126 x + 96 x^2 - 18 x^3 + x^4, (-9 + x) (-3 + x) (-3 - 6 x + x^2),
    -65 - 126 x + 96 x^2 - 18 x^3 + x^4, (-7 + x) (7 + 19 x - 11 x^2 + x^3),
    (-5 + x) (37 + 31 x - 13 x^2 + x^3), -169 - 118 x + 96 x^2 - 18 x^3 + x^4,
    (-9 + x) (17 + 15 x - 9 x^2 + x^3), -137 - 118 x + 96 x^2 - 18 x^3 + x^4,
    -121 - 118 x + 96 x^2 - 18 x^3 + x^4, (-7 + x) (-3 + x) (-5 - 8 x + x^2),
    (-5 + x) (61 + 31 x - 13 x^2 + x^3), -289 - 94 x + 96 x^2 - 18 x^3 + x^4,
    (-7 + x) (39 + 19 x - 11 x^2 + x^3), (-7 + x) (-5 + x) (-11 - 6 x + x^2)};
```

In[ ]:=
```
warrantpoly = {31 - 142 x + 96 x^2 - 18 x^3 + x^4, (-7 + x) (-1 + 19 x - 11 x^2 + x^3)}
```

Out[ ]=
$$\left\{31 - 142\, x + 96\, x^2 - 18\, x^3 + x^4,\ (-7 + x)\left(-1 + 19\, x - 11\, x^2 + x^3\right)\right\}$$

In[ ]:=
```
anglesquared = anglesquaredmat[chi, list] // FullSimplify;
```

In[ ]:= **anglesquared // MatrixForm**

Out[ ]//MatrixForm=

$$\begin{pmatrix}
\frac{35}{72} & \frac{7\left(57+5\sqrt{57}\right)}{2736} & 0 & \frac{2}{9} & \frac{7}{48}-\frac{35}{48\sqrt{57}} \\
\frac{39}{80} & \frac{97}{672}+\frac{45\sqrt{\frac{3}{19}}}{224} & \frac{2}{35} & \frac{1}{6} & \frac{97}{672}-\frac{45\sqrt{\frac{3}{19}}}{224} \\
\frac{22}{45} & \frac{1}{7}+\frac{10}{21\sqrt{57}} & \frac{4}{35} & \frac{1}{9} & \frac{1}{7}-\frac{10}{21\sqrt{57}} \\
\frac{353}{720} & \frac{5\left(1083+47\sqrt{57}\right)}{38\,304} & \frac{6}{35} & \frac{1}{18} & \frac{95}{672}-\frac{235}{672\sqrt{57}} \\
\frac{59}{120} & \frac{893+25\sqrt{57}}{6384} & \frac{8}{35} & 0 & \frac{893-25\sqrt{57}}{6384} \\
\frac{29}{60} & \frac{1}{168}\left(29+\sqrt{57}\right) & \frac{6}{35} & 0 & \frac{1}{168}\left(29-\sqrt{57}\right) \\
\frac{67}{144} & \frac{23}{96}+\frac{67}{96\sqrt{57}} & 0 & \frac{1}{18} & \frac{23}{96}-\frac{67}{96\sqrt{57}} \\
\frac{7}{15} & \frac{5}{21}+\frac{4}{7\sqrt{57}} & \frac{2}{35} & 0 & \frac{5}{21}-\frac{4}{7\sqrt{57}} \\
\frac{23}{48} & \frac{17}{96}+\frac{23}{32\sqrt{57}} & 0 & \frac{1}{6} & \frac{17}{96}-\frac{23}{32\sqrt{57}} \\
\frac{173}{360} & \frac{59}{336}+\frac{199}{336\sqrt{57}} & \frac{2}{35} & \frac{1}{9} & \frac{59}{336}-\frac{199}{336\sqrt{57}} \\
\frac{347}{720} & \frac{39}{224}+\frac{313}{672\sqrt{57}} & \frac{4}{35} & \frac{1}{18} & \frac{39}{224}-\frac{313}{672\sqrt{57}} \\
\frac{47}{90} & \frac{57+\sqrt{57}}{4788} & \frac{12}{35} & \frac{1}{9} & \frac{1}{84}-\frac{1}{84\sqrt{57}} \\
\frac{41}{80} & \frac{1}{672}\left(31+3\sqrt{57}\right) & \frac{8}{35} & \frac{1}{6} & \frac{1}{672}\left(31-3\sqrt{57}\right) \\
\frac{37}{72} & \frac{5}{112}+\frac{43}{336\sqrt{57}} & \frac{2}{7} & \frac{1}{9} & \frac{5}{112}-\frac{43}{336\sqrt{57}} \\
\frac{371}{720} & \frac{1653+\sqrt{57}}{38\,304} & \frac{12}{35} & \frac{1}{18} & \frac{29}{672}-\frac{1}{672\sqrt{57}} \\
\frac{31}{60} & \frac{1}{24}-\frac{1}{8\sqrt{57}} & \frac{2}{5} & 0 & \frac{1}{456}\left(19+\sqrt{57}\right) \\
\frac{181}{360} & \frac{9}{112}+\frac{167}{336\sqrt{57}} & \frac{4}{35} & \frac{2}{9} & \frac{9}{112}-\frac{167}{336\sqrt{57}} \\
\frac{121}{240} & \frac{53}{672}+\frac{83}{224\sqrt{57}} & \frac{6}{35} & \frac{1}{6} & \frac{53}{672}-\frac{83}{224\sqrt{57}} \\
\frac{91}{180} & \frac{741+41\sqrt{57}}{9576} & \frac{8}{35} & \frac{1}{9} & \frac{741-41\sqrt{57}}{9576} \\
\frac{73}{144} & \frac{17}{224}+\frac{79}{672\sqrt{57}} & \frac{2}{7} & \frac{1}{18} & \frac{17}{224}-\frac{79}{672\sqrt{57}} \\
\frac{61}{120} & \frac{475-\sqrt{57}}{6384} & \frac{12}{35} & 0 & \frac{475+\sqrt{57}}{6384} \\
\frac{71}{144} & \frac{11}{96}+\frac{71}{96\sqrt{57}} & 0 & \frac{5}{18} & \frac{11}{96}-\frac{71}{96\sqrt{57}} \\
\frac{89}{180} & \frac{1083+103\sqrt{57}}{9576} & \frac{2}{35} & \frac{2}{9} & \frac{1083-103\sqrt{57}}{9576} \\
\frac{119}{240} & \frac{25}{224}+\frac{109}{224\sqrt{57}} & \frac{4}{35} & \frac{1}{6} & \frac{25}{224}-\frac{109}{224\sqrt{57}} \\
\frac{179}{360} & \frac{37}{336}+\frac{121}{336\sqrt{57}} & \frac{6}{35} & \frac{1}{9} & \frac{37}{336}-\frac{121}{336\sqrt{57}} \\
\frac{359}{720} & \frac{73}{672}+\frac{157}{672\sqrt{57}} & \frac{8}{35} & \frac{1}{18} & \frac{73}{672}-\frac{157}{672\sqrt{57}} \\
\frac{1}{2} & \frac{1}{532}\left(57+\sqrt{57}\right) & \frac{2}{7} & 0 & \frac{1}{532}\left(57-\sqrt{57}\right) \\
\frac{17}{36} & \frac{5}{24}+\frac{17}{24\sqrt{57}} & 0 & \frac{1}{9} & \frac{5}{24}-\frac{17}{24\sqrt{57}} \\
\frac{341}{720} & \frac{7923+391\sqrt{57}}{38\,304} & \frac{2}{35} & \frac{1}{18} & \frac{7923-391\sqrt{57}}{38\,304} \\
\frac{19}{40} & \frac{437+17\sqrt{57}}{2128} & \frac{4}{35} & 0 & \frac{437-17\sqrt{57}}{2128} \\
\frac{11}{24} & \frac{1}{912}\left(247+11\sqrt{57}\right) & 0 & 0 & \frac{1}{912}\left(247-11\sqrt{57}\right)
\end{pmatrix}$$

In[ ]:= **anglemat = Sqrt[anglesquared] // FullSimplify;**

In[ ]:= anglemat // MatrixForm

Out[ ]//MatrixForm=

$\frac{\sqrt{\frac{35}{2}}}{6}$	$\sqrt{\frac{7}{48}+\frac{35}{48\sqrt{57}}}$	0	$\frac{\sqrt{2}}{3}$	$\sqrt{\frac{7}{48}-\frac{35}{48\sqrt{57}}}$
$\frac{\sqrt{\frac{39}{5}}}{4}$	$\sqrt{\frac{97}{672}+\frac{45\sqrt{\frac{3}{19}}}{224}}$	$\sqrt{\frac{2}{35}}$	$\frac{1}{\sqrt{6}}$	$\sqrt{\frac{97}{672}-\frac{45\sqrt{\frac{3}{19}}}{224}}$
$\frac{\sqrt{\frac{22}{5}}}{3}$	$\sqrt{\frac{1}{7}+\frac{10}{21\sqrt{57}}}$	$\frac{2}{\sqrt{35}}$	$\frac{1}{3}$	$\sqrt{\frac{1}{7}-\frac{10}{21\sqrt{57}}}$
$\frac{\sqrt{\frac{353}{5}}}{12}$	$\sqrt{\frac{95}{672}+\frac{235}{672\sqrt{57}}}$	$\sqrt{\frac{6}{35}}$	$\frac{1}{3\sqrt{2}}$	$\sqrt{\frac{95}{672}-\frac{235}{672\sqrt{57}}}$
$\frac{\sqrt{\frac{59}{30}}}{2}$	$\sqrt{\frac{47}{336}+\frac{25}{112\sqrt{57}}}$	$2\sqrt{\frac{2}{35}}$	0	0.332...
$\frac{\sqrt{\frac{29}{15}}}{2}$	0.466...	$\sqrt{\frac{6}{35}}$	0	0.357...
$\frac{\sqrt{67}}{12}$	$\sqrt{\frac{23}{96}+\frac{67}{96\sqrt{57}}}$	0	$\frac{1}{3\sqrt{2}}$	$\sqrt{\frac{23}{96}-\frac{67}{96\sqrt{57}}}$
$\sqrt{\frac{7}{15}}$	$\sqrt{\frac{5}{21}+\frac{4}{7\sqrt{57}}}$	$\sqrt{\frac{2}{35}}$	0	$\sqrt{\frac{5}{21}-\frac{4}{7\sqrt{57}}}$
$\frac{\sqrt{\frac{23}{3}}}{4}$	$\sqrt{\frac{17}{96}+\frac{23}{32\sqrt{57}}}$	0	$\frac{1}{\sqrt{6}}$	$\sqrt{\frac{17}{96}-\frac{23}{32\sqrt{57}}}$
$\frac{\sqrt{\frac{173}{10}}}{6}$	$\sqrt{\frac{59}{336}+\frac{199}{336\sqrt{57}}}$	$\sqrt{\frac{2}{35}}$	$\frac{1}{3}$	$\sqrt{\frac{59}{336}-\frac{199}{336\sqrt{57}}}$
$\frac{\sqrt{\frac{347}{5}}}{12}$	$\sqrt{\frac{39}{224}+\frac{313}{672\sqrt{57}}}$	$\frac{2}{\sqrt{35}}$	$\frac{1}{3\sqrt{2}}$	$\sqrt{\frac{39}{224}-\frac{313}{672\sqrt{57}}}$
$\frac{\sqrt{\frac{47}{10}}}{3}$	$\frac{1}{6}\sqrt{\frac{1}{133}\left(57+\sqrt{57}\right)}$	$2\sqrt{\frac{3}{35}}$	$\frac{1}{3}$	$\sqrt{\frac{1}{84}-\frac{1}{84\sqrt{57}}}$
$\frac{\sqrt{\frac{41}{5}}}{4}$	0.283...	$2\sqrt{\frac{2}{35}}$	$\frac{1}{\sqrt{6}}$	0.111...
$\frac{\sqrt{\frac{37}{2}}}{6}$	$\sqrt{\frac{5}{112}+\frac{43}{336\sqrt{57}}}$	$\sqrt{\frac{2}{7}}$	$\frac{1}{3}$	$\sqrt{\frac{5}{112}-\frac{43}{336\sqrt{57}}}$
$\frac{\sqrt{\frac{371}{5}}}{12}$	$\frac{1}{12}\sqrt{\frac{1}{266}\left(1653+\sqrt{57}\right)}$	$2\sqrt{\frac{3}{35}}$	$\frac{1}{3\sqrt{2}}$	$\sqrt{\frac{29}{672}-\frac{1}{672\sqrt{57}}}$
$\frac{\sqrt{\frac{31}{15}}}{2}$	$\sqrt{\frac{1}{24}-\frac{1}{8\sqrt{57}}}$	$\sqrt{\frac{2}{5}}$	0	0.241...
$\frac{\sqrt{\frac{181}{10}}}{6}$	$\sqrt{\frac{9}{112}+\frac{167}{336\sqrt{57}}}$	$\frac{2}{\sqrt{35}}$	$\frac{\sqrt{2}}{3}$	$\sqrt{\frac{9}{112}-\frac{167}{336\sqrt{57}}}$
$\frac{11}{4\sqrt{15}}$	$\sqrt{\frac{53}{672}+\frac{83}{224\sqrt{57}}}$	$\sqrt{\frac{6}{35}}$	$\frac{1}{\sqrt{6}}$	$\sqrt{\frac{53}{672}-\frac{83}{224\sqrt{57}}}$
$\frac{\sqrt{\frac{91}{5}}}{6}$	$\sqrt{\frac{13}{168}+\frac{41}{168\sqrt{57}}}$	$2\sqrt{\frac{2}{35}}$	$\frac{1}{3}$	0.212...
$\frac{\sqrt{73}}{12}$	$\sqrt{\frac{17}{224}+\frac{79}{672\sqrt{57}}}$	$\sqrt{\frac{2}{7}}$	$\frac{1}{3\sqrt{2}}$	$\sqrt{\frac{17}{224}-\frac{79}{672\sqrt{57}}}$
$\frac{\sqrt{\frac{61}{30}}}{2}$	0.271...	$2\sqrt{\frac{3}{35}}$	0	$\frac{1}{4}\sqrt{\frac{1}{399}\left(475+\sqrt{57}\right)}$
$\frac{\sqrt{71}}{12}$	$\sqrt{\frac{11}{96}+\frac{71}{96\sqrt{57}}}$	0	$\frac{\sqrt{\frac{5}{2}}}{3}$	$\sqrt{\frac{11}{96}-\frac{71}{96\sqrt{57}}}$
$\frac{\sqrt{\frac{89}{5}}}{6}$	$\sqrt{\frac{19}{168}+\frac{103}{168\sqrt{57}}}$	$\sqrt{\frac{2}{35}}$	$\frac{\sqrt{2}}{3}$	0.179...
$\frac{\sqrt{\frac{119}{15}}}{4}$	0.420...	$\frac{2}{\sqrt{35}}$	$\frac{1}{\sqrt{6}}$	0.217...

$$\begin{pmatrix} \frac{\sqrt{\frac{179}{10}}}{6} & \sqrt{\frac{37}{336}+\frac{121}{336\sqrt{57}}} & \sqrt{\frac{6}{35}} & \frac{1}{3} & \sqrt{\frac{37}{336}-\frac{121}{336\sqrt{57}}} \\ \frac{\sqrt{\frac{359}{5}}}{12} & \sqrt{\frac{73}{672}+\frac{157}{672\sqrt{57}}} & 2\sqrt{\frac{2}{35}} & \frac{1}{3\sqrt{2}} & \sqrt{\frac{73}{672}-\frac{157}{672\sqrt{57}}} \\ \frac{1}{\sqrt{2}} & 0.348\ldots & \sqrt{\frac{2}{7}} & 0 & 0.305\ldots \\ \frac{\sqrt{17}}{6} & \sqrt{\frac{5}{24}+\frac{17}{24\sqrt{57}}} & 0 & \frac{1}{3} & \sqrt{\frac{5}{24}-\frac{17}{24\sqrt{57}}} \\ \frac{\sqrt{\frac{341}{5}}}{12} & \sqrt{\frac{139}{672}+\frac{391}{672\sqrt{57}}} & \sqrt{\frac{2}{35}} & \frac{1}{3\sqrt{2}} & 0.360\ldots \\ \frac{\sqrt{\frac{19}{10}}}{2} & 0.515\ldots & \frac{2}{\sqrt{35}} & 0 & 0.381\ldots \\ \frac{\sqrt{\frac{11}{6}}}{2} & \sqrt{\frac{13}{48}+\frac{11}{16\sqrt{57}}} & 0 & 0 & \frac{1}{4}\sqrt{\frac{13}{3}-\frac{11}{\sqrt{57}}} \end{pmatrix}$$

In[•]:= **chi**

Out[•]= $(-7+x)^2\,(-5+x)^{10}\,(5+x)^{15}\left(16-11\,x+x^2\right)$

In[•]:= **coeff[chi, (x + 5) (x - 5) (x - 7)] // FullSimplify**

Out[•]= $\left\{-\frac{3}{2}\left(-85+\sqrt{57}\right),\ \frac{3}{2}\left(85+\sqrt{57}\right)\right\}$

In[•]:= **combinationangle[{-3/2 (-85 + Sqrt[57]), 3/2 (85 + Sqrt[57])},**
{12, 16}, {2, 5}, anglemat] // FullSimplify

Out[•]= $\left\{\sqrt{\frac{1}{57}\left(921+128\sqrt{42}\right)},\ -1.27\ldots\right\}$

In[•]:= **RootReduce[Sqrt[1/57 (921 + 128 Sqrt[42])]]**

Out[•]= 5.54...

```
combinations[chi, (x + 5) (x - 5) (x - 7), warrantpoly[[1]],
  warrantpoly[[2]], list, anglesquared] // FullSimplify
```

$$\left\{\sqrt{\frac{1}{57}\left(921+128\sqrt{42}\right)},\ \text{Root}\left[2809-1842\,\#1^2+57\,\#1^4\ \&,\ 2\right]\right\}$$

```
compatible[combinations[chi, (x + 5) (x - 5) (x - 7),
   warrantpoly[[1]], warrantpoly[[2]], list, anglesquared] // FullSimplify]
0
```

In[•]:=
```
chi = (-7 + x)^2 (-5 + x)^9 (-3 + x) (5 + x)^15 (32 - 13 x + x^2)
```

Out[•]=
$$(-7+x)^2\,(-5+x)^9\,(-3+x)\,(5+x)^{15}\,\left(32-13\,x+x^2\right)$$

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

```
{{-219, 853, -638, 186, -23, 1},
 {-3, 757, -630, 186, -23, 1}, {-51, 773, -630, 186, -23, 1},
 {-99, 789, -630, 186, -23, 1}, {-147, 805, -630, 186, -23, 1},
 {165, 677, -622, 186, -23, 1}, {117, 693, -622, 186, -23, 1},
 {69, 709, -622, 186, -23, 1}, {21, 725, -622, 186, -23, 1},
 {365, 597, -614, 186, -23, 1}, {285, 613, -614, 186, -23, 1},
 {237, 629, -614, 186, -23, 1}, {189, 645, -614, 186, -23, 1},
 {485, 533, -606, 186, -23, 1}, {405, 549, -606, 186, -23, 1},
 {437, 549, -606, 186, -23, 1}, {357, 565, -606, 186, -23, 1},
 {605, 469, -598, 186, -23, 1}, {525, 485, -598, 186, -23, 1}}
```

```
A = {{-219, 853, -638, 186, -23, 1},
    {-3, 757, -630, 186, -23, 1}, {-51, 773, -630, 186, -23, 1},
    {-99, 789, -630, 186, -23, 1}, {-147, 805, -630, 186, -23, 1},
    {165, 677, -622, 186, -23, 1}, {117, 693, -622, 186, -23, 1},
    {69, 709, -622, 186, -23, 1}, {21, 725, -622, 186, -23, 1},
    {365, 597, -614, 186, -23, 1}, {285, 613, -614, 186, -23, 1},
    {237, 629, -614, 186, -23, 1}, {189, 645, -614, 186, -23, 1},
    {485, 533, -606, 186, -23, 1}, {405, 549, -606, 186, -23, 1},
    {437, 549, -606, 186, -23, 1}, {357, 565, -606, 186, -23, 1},
    {605, 469, -598, 186, -23, 1}, {525, 485, -598, 186, -23, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
-219 & 853 & -638 & 186 & -23 & 1 \\
-3 & 757 & -630 & 186 & -23 & 1 \\
-51 & 773 & -630 & 186 & -23 & 1 \\
-99 & 789 & -630 & 186 & -23 & 1 \\
-147 & 805 & -630 & 186 & -23 & 1 \\
165 & 677 & -622 & 186 & -23 & 1 \\
117 & 693 & -622 & 186 & -23 & 1 \\
69 & 709 & -622 & 186 & -23 & 1 \\
21 & 725 & -622 & 186 & -23 & 1 \\
365 & 597 & -614 & 186 & -23 & 1 \\
285 & 613 & -614 & 186 & -23 & 1 \\
237 & 629 & -614 & 186 & -23 & 1 \\
189 & 645 & -614 & 186 & -23 & 1 \\
485 & 533 & -606 & 186 & -23 & 1 \\
405 & 549 & -606 & 186 & -23 & 1 \\
437 & 549 & -606 & 186 & -23 & 1 \\
357 & 565 & -606 & 186 & -23 & 1 \\
605 & 469 & -598 & 186 & -23 & 1 \\
525 & 485 & -598 & 186 & -23 & 1
\end{pmatrix}$$

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

```
{-2935, 22 993, -18 286, 5394, -667, 29}
```

```
FindInstance[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 &&
  n[6] ≥ 0 && n[7] ≥ 0 && n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 &&
  n[12] ≥ 0 && n[13] ≥ 0 && n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && n[17] ≥ 0 &&
  n[18] ≥ 0 && n[19] ≥ 0 && Array[n, 19].A == g, Array[n, 19], Integers]
```

```
{{n[1] → 14, n[2] → 0, n[3] → 0, n[4] → 0, n[5] → 11, n[6] → 0,
  n[7] → 0, n[8] → 0, n[9] → 0, n[10] → 0, n[11] → 0, n[12] → 0, n[13] → 0,
  n[14] → 0, n[15] → 0, n[16] → 4, n[17] → 0, n[18] → 0, n[19] → 0}}
```

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

```
{-219 c[1] + 853 c[2] - 638 c[3] + 186 c[4] - 23 c[5] + c[6],
 -3 c[1] + 757 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6],
 -51 c[1] + 773 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6],
 -99 c[1] + 789 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6],
 -147 c[1] + 805 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6],
 165 c[1] + 677 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6],
 117 c[1] + 693 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6],
 69 c[1] + 709 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6],
 21 c[1] + 725 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6],
 365 c[1] + 597 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6],
 285 c[1] + 613 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6],
 237 c[1] + 629 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6],
 189 c[1] + 645 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6],
 485 c[1] + 533 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6],
 405 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6],
 437 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6],
 357 c[1] + 565 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6],
 605 c[1] + 469 c[2] - 598 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]}
```

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

```
-2935 c[1] + 22 993 c[2] - 18 286 c[3] + 5394 c[4] - 667 c[5] + 29 c[6]
```

```
warrant1 = Flatten[Array[c, 6] /. FindInstance[
     -2935 c[1] + 22 993 c[2] - 18 286 c[3] + 5394 c[4] - 667 c[5] + 29 c[6] < 0 &&
      -219 c[1] + 853 c[2] - 638 c[3] + 186 c[4] - 23 c[5] + c[6] < 0 &&
      -3 c[1] + 757 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -51 c[1] + 773 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -99 c[1] + 789 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -147 c[1] + 805 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      165 c[1] + 677 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      117 c[1] + 693 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      69 c[1] + 709 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      21 c[1] + 725 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      365 c[1] + 597 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      285 c[1] + 613 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      237 c[1] + 629 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      189 c[1] + 645 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      485 c[1] + 533 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      405 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      437 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      357 c[1] + 565 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      605 c[1] + 469 c[2] - 598 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, Array[c, 6], Integers]]
{-235, -703, -845, 0, 0, 0}

GCD[-235, -703, -845, 0, 0, 0]
1

Reverse[warrant1]
{0, 0, 0, -845, -703, -235}

warrant1.g
-22 684

warrant1.Transpose[A]
{-9084, 884, 916, 948, 980, 10 884, 10 916, 10 948, 10 980, 13 364,
 20 916, 20 948, 20 980, 23 396, 30 948, 23 428, 30 980, 33 428, 40 980}
```

```
warrant2 = Flatten[Array[c, 6] /. FindInstance[
     -2935 c[1] + 22 993 c[2] - 18 286 c[3] + 5394 c[4] - 667 c[5] + 29 c[6] < 0 &&
      -219 c[1] + 853 c[2] - 638 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -3 c[1] + 757 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -51 c[1] + 773 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -99 c[1] + 789 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      -147 c[1] + 805 c[2] - 630 c[3] + 186 c[4] - 23 c[5] + c[6] < 0 &&
      165 c[1] + 677 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      117 c[1] + 693 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      69 c[1] + 709 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      21 c[1] + 725 c[2] - 622 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      365 c[1] + 597 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      285 c[1] + 613 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      237 c[1] + 629 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      189 c[1] + 645 c[2] - 614 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      485 c[1] + 533 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      405 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      437 c[1] + 549 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      357 c[1] + 565 c[2] - 606 c[3] + 186 c[4] - 23 c[5] + c[6] ≥ 0 &&
      605 c[1] + 469 c[2] - 598 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, Array[c, 6], Integers]]
{-433, -1593, -6261, 0, 0, -2 729 736}

GCD[-433, -1593, -6261, 0, 0, -2 729 736]
1

Reverse[warrant2]
{-2 729 736, 0, 0, -6261, -1593, -433}

warrant2.g
-30 692

warrant2.Transpose[A]
{780, 10 092, 5388, 684, -4020, 14 700, 9996, 5292, 588,
 5452, 14 604, 9900, 5196, 5356, 14 508, 652, 9804, 5260, 14 412}
```

```
feasibleinterlacingpolylist[chi]
```

$$\{(-3+x)\,(73-260\,x+126\,x^2-20\,x^3+x^4),\ (-3+x)\,(1-252\,x+126\,x^2-20\,x^3+x^4),\ (-3+x)\,(17-252\,x+126\,x^2-20\,x^3+x^4),\ (-3+x)\,(33-252\,x+126\,x^2-20\,x^3+x^4),\ (-7+x)\,(-3+x)\,(-7+35\,x-13\,x^2+x^3),\ (-5+x)\,(-3+x)\,(11+51\,x-15\,x^2+x^3),\ (-3+x)\,(-39-244\,x+126\,x^2-20\,x^3+x^4),\ (-3+x)\,(-23-244\,x+126\,x^2-20\,x^3+x^4),\ (-7+x)\,(-3+x)\,(1+35\,x-13\,x^2+x^3),\ (-5+x)\,(-73-134\,x+96\,x^2-18\,x^3+x^4),\ (-5+x)\,(-3+x)\,(19+51\,x-15\,x^2+x^3),\ (-3+x)\,(-79-236\,x+126\,x^2-20\,x^3+x^4),\ (-9+x)\,(-7+x)\,(-3+x)\,(-1-4\,x+x^2),\ (-5+x)\,(-97-126\,x+96\,x^2-18\,x^3+x^4),\ (-9+x)\,(-5+x)\,(-3+x)\,(-3-6\,x+x^2),\ 437+549\,x-606\,x^2+186\,x^3-23\,x^4+x^5,\ (-7+x)\,(-3+x)\,(17+35\,x-13\,x^2+x^3),\ (-5+x)\,(-121-118\,x+96\,x^2-18\,x^3+x^4),\ (-7+x)\,(-5+x)\,(-3+x)\,(-5-8\,x+x^2)\}$$

```
list = {(-3 + x) (73 - 260 x + 126 x^2 - 20 x^3 + x^4),
    (-3 + x) (1 - 252 x + 126 x^2 - 20 x^3 + x^4), (-3 + x) (17 - 252 x + 126 x^2 - 20 x^3 + x^4),
    (-3 + x) (33 - 252 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-3 + x) (-7 + 35 x - 13 x^2 + x^3),
    (-5 + x) (-3 + x) (11 + 51 x - 15 x^2 + x^3), (-3 + x) (-39 - 244 x + 126 x^2 - 20 x^3 + x^4),
    (-3 + x) (-23 - 244 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-3 + x) (1 + 35 x - 13 x^2 + x^3),
    (-5 + x) (-73 - 134 x + 96 x^2 - 18 x^3 + x^4), (-5 + x) (-3 + x) (19 + 51 x - 15 x^2 + x^3),
    (-3 + x) (-79 - 236 x + 126 x^2 - 20 x^3 + x^4), (-9 + x) (-7 + x) (-3 + x) (-1 - 4 x + x^2),
    (-5 + x) (-97 - 126 x + 96 x^2 - 18 x^3 + x^4), (-9 + x) (-5 + x) (-3 + x) (-3 - 6 x + x^2),
    437 + 549 x - 606 x^2 + 186 x^3 - 23 x^4 + x^5, (-7 + x) (-3 + x) (17 + 35 x - 13 x^2 + x^3),
    (-5 + x) (-121 - 118 x + 96 x^2 - 18 x^3 + x^4), (-7 + x) (-5 + x) (-3 + x) (-5 - 8 x + x^2)};
```

```
warrantpoly =
 {(-3 + x) (73 - 260 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-3 + x) (-7 + 35 x - 13 x^2 + x^3)}
```

$$\{(-3+x)\,(73-260\,x+126\,x^2-20\,x^3+x^4),\ (-7+x)\,(-3+x)\,(-7+35\,x-13\,x^2+x^3)\}$$

```
anglesquared = anglesquaredmat[chi, list] // FullSimplify;
```

```
anglesquared // MatrixForm
```

$$\begin{pmatrix}
\frac{478}{915} & 0 & \frac{1107+133\sqrt{41}}{50\,020} & \frac{3}{10} & \frac{2}{15} & \frac{1107-133\sqrt{41}}{50\,020} \\
\frac{157}{305} & 0 & \frac{4633+647\sqrt{41}}{50\,020} & \frac{1}{10} & \frac{1}{5} & \frac{4633-647\sqrt{41}}{50\,020} \\
\frac{472}{915} & 0 & \frac{943+102\sqrt{41}}{12\,505} & \frac{1}{5} & \frac{2}{15} & \frac{943-102\sqrt{41}}{12\,505} \\
\frac{473}{915} & 0 & \frac{2911+169\sqrt{41}}{50\,020} & \frac{3}{10} & \frac{1}{15} & \frac{2911-169\sqrt{41}}{50\,020} \\
\frac{158}{305} & 0 & \frac{205-7\sqrt{41}}{5002} & \frac{2}{5} & 0 & \frac{205+7\sqrt{41}}{5002} \\
\frac{31}{61} & 0 & \frac{89}{610}+\frac{461}{610\sqrt{41}} & 0 & \frac{1}{5} & \frac{89}{610}-\frac{461}{610\sqrt{41}} \\
\frac{466}{915} & 0 & \frac{6437+683\sqrt{41}}{50\,020} & \frac{1}{10} & \frac{2}{15} & \frac{6437-683\sqrt{41}}{50\,020} \\
\frac{467}{915} & 0 & \frac{34}{305}+\frac{111}{305\sqrt{41}} & \frac{1}{5} & \frac{1}{15} & \frac{34}{305}-\frac{111}{305\sqrt{41}} \\
\frac{156}{305} & 0 & \frac{1}{244}\left(23+\sqrt{41}\right) & \frac{3}{10} & 0 & \frac{1}{244}\left(23-\sqrt{41}\right) \\
\frac{367}{732} & \frac{1}{4} & \frac{205-7\sqrt{41}}{5002} & 0 & \frac{1}{6} & \frac{205+7\sqrt{41}}{5002} \\
\frac{92}{183} & 0 & \frac{4551+479\sqrt{41}}{25\,010} & 0 & \frac{2}{15} & \frac{4551-479\sqrt{41}}{25\,010} \\
\frac{461}{915} & 0 & \frac{8241+719\sqrt{41}}{50\,020} & \frac{1}{10} & \frac{1}{15} & \frac{8241-719\sqrt{41}}{50\,020} \\
\frac{154}{305} & 0 & \frac{9}{61}+\frac{24}{61\sqrt{41}} & \frac{1}{5} & 0 & \frac{9}{61}-\frac{24}{61\sqrt{41}} \\
\frac{121}{244} & \frac{1}{4} & \frac{47}{610}-\frac{17}{610\sqrt{41}} & 0 & \frac{1}{10} & \frac{47}{610}+\frac{17}{610\sqrt{41}} \\
\frac{91}{183} & 0 & \frac{7\left(779+71\sqrt{41}\right)}{25\,010} & 0 & \frac{1}{15} & -\frac{7\left(-779+71\sqrt{41}\right)}{25\,010} \\
\frac{1819}{3660} & \frac{1}{4} & \frac{2993-273\sqrt{41}}{50\,020} & \frac{1}{10} & \frac{1}{30} & \frac{2993+273\sqrt{41}}{50\,020} \\
\frac{152}{305} & 0 & \frac{49}{244}+\frac{151}{244\sqrt{41}} & \frac{1}{10} & 0 & \frac{49}{244}-\frac{151}{244\sqrt{41}} \\
\frac{359}{732} & \frac{1}{4} & \frac{2829+\sqrt{41}}{25\,010} & 0 & \frac{1}{30} & \frac{69}{610}-\frac{1}{610\sqrt{41}} \\
\frac{30}{61} & 0 & \frac{1271+103\sqrt{41}}{5002} & 0 & 0 & \frac{1271-103\sqrt{41}}{5002}
\end{pmatrix}$$

```
combinations[chi, (x + 5) (x - 5) (x - 7), warrantpoly[[1]],
  warrantpoly[[2]], list, anglesquared] // FullSimplify
```

$$\left\{\sqrt{\frac{5}{41}\left(101+64\sqrt{2}\right)},\ -\sqrt{\frac{5}{41}\left(101-64\sqrt{2}\right)},\right.$$
$$\left.\sqrt{\frac{5}{41}\left(101-64\sqrt{2}\right)},\ -\sqrt{\frac{5}{41}\left(101+64\sqrt{2}\right)}\right\}$$

```
compatible[combinations[chi, (x + 5) (x - 5) (x - 7),
   warrantpoly[[1]], warrantpoly[[2]], list, anglesquared] // FullSimplify]
```

```
0
```

```
chi = (-7 + x) (-5 + x)^10 (5 + x)^15 (-128 + 93 x - 18 x^2 + x^3)
```

$$(-7+x)\,(-5+x)^{10}\,(5+x)^{15}\left(-128+93\,x-18\,x^2+x^3\right)$$

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

```
{{1575, 545, -782, 222, -25, 1},
 {-137, 1121, -830, 222, -25, 1}, {-105, 1121, -830, 222, -25, 1},
 {-249, 1137, -830, 222, -25, 1}, {-217, 1137, -830, 222, -25, 1},
 {-329, 1153, -830, 222, -25, 1}, {223, 1009, -822, 222, -25, 1},
 {255, 1009, -822, 222, -25, 1}, {143, 1025, -822, 222, -25, 1},
 {175, 1025, -822, 222, -25, 1}, {31, 1041, -822, 222, -25, 1},
 {63, 1041, -822, 222, -25, 1}, {-49, 1057, -822, 222, -25, 1},
 {-161, 1073, -822, 222, -25, 1}, {695, 881, -814, 222, -25, 1},
 {615, 897, -814, 222, -25, 1}, {503, 913, -814, 222, -25, 1},
 {535, 913, -814, 222, -25, 1}, {423, 929, -814, 222, -25, 1},
 {455, 929, -814, 222, -25, 1}, {343, 945, -814, 222, -25, 1},
 {231, 961, -814, 222, -25, 1}, {975, 785, -806, 222, -25, 1},
 {895, 801, -806, 222, -25, 1}, {815, 817, -806, 222, -25, 1},
 {703, 833, -806, 222, -25, 1}, {735, 833, -806, 222, -25, 1},
 {623, 849, -806, 222, -25, 1}, {511, 865, -806, 222, -25, 1},
 {1175, 705, -798, 222, -25, 1}, {1095, 721, -798, 222, -25, 1},
 {983, 737, -798, 222, -25, 1}, {1015, 737, -798, 222, -25, 1},
 {903, 753, -798, 222, -25, 1}, {1375, 625, -790, 222, -25, 1},
 {1295, 641, -790, 222, -25, 1}, {1183, 657, -790, 222, -25, 1},
 {1655, 529, -782, 222, -25, 1}, {1463, 561, -782, 222, -25, 1},
 {1855, 449, -774, 222, -25, 1}, {2135, 353, -766, 222, -25, 1}}
```

```
A = {{-137, 1121, -830, 222, -25, 1},
    {-105, 1121, -830, 222, -25, 1}, {-249, 1137, -830, 222, -25, 1},
    {-217, 1137, -830, 222, -25, 1}, {-329, 1153, -830, 222, -25, 1},
    {223, 1009, -822, 222, -25, 1}, {255, 1009, -822, 222, -25, 1},
    {143, 1025, -822, 222, -25, 1}, {175, 1025, -822, 222, -25, 1},
    {31, 1041, -822, 222, -25, 1}, {63, 1041, -822, 222, -25, 1},
    {-49, 1057, -822, 222, -25, 1}, {-161, 1073, -822, 222, -25, 1},
    {695, 881, -814, 222, -25, 1}, {615, 897, -814, 222, -25, 1},
    {503, 913, -814, 222, -25, 1}, {535, 913, -814, 222, -25, 1},
    {423, 929, -814, 222, -25, 1}, {455, 929, -814, 222, -25, 1},
    {343, 945, -814, 222, -25, 1}, {231, 961, -814, 222, -25, 1},
    {975, 785, -806, 222, -25, 1}, {895, 801, -806, 222, -25, 1},
    {815, 817, -806, 222, -25, 1}, {703, 833, -806, 222, -25, 1},
    {735, 833, -806, 222, -25, 1}, {623, 849, -806, 222, -25, 1},
    {511, 865, -806, 222, -25, 1}, {1175, 705, -798, 222, -25, 1},
    {1095, 721, -798, 222, -25, 1}, {983, 737, -798, 222, -25, 1},
    {1015, 737, -798, 222, -25, 1}, {903, 753, -798, 222, -25, 1},
    {1375, 625, -790, 222, -25, 1}, {1295, 641, -790, 222, -25, 1},
    {1183, 657, -790, 222, -25, 1}, {1655, 529, -782, 222, -25, 1},
    {1575, 545, -782, 222, -25, 1}, {1463, 561, -782, 222, -25, 1},
    {1855, 449, -774, 222, -25, 1}, {2135, 353, -766, 222, -25, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix}
-137 & 1121 & -830 & 222 & -25 & 1 \\
-105 & 1121 & -830 & 222 & -25 & 1 \\
-249 & 1137 & -830 & 222 & -25 & 1 \\
-217 & 1137 & -830 & 222 & -25 & 1 \\
-329 & 1153 & -830 & 222 & -25 & 1 \\
223 & 1009 & -822 & 222 & -25 & 1 \\
255 & 1009 & -822 & 222 & -25 & 1 \\
143 & 1025 & -822 & 222 & -25 & 1 \\
175 & 1025 & -822 & 222 & -25 & 1 \\
31 & 1041 & -822 & 222 & -25 & 1 \\
63 & 1041 & -822 & 222 & -25 & 1 \\
-49 & 1057 & -822 & 222 & -25 & 1 \\
-161 & 1073 & -822 & 222 & -25 & 1 \\
695 & 881 & -814 & 222 & -25 & 1 \\
615 & 897 & -814 & 222 & -25 & 1 \\
503 & 913 & -814 & 222 & -25 & 1 \\
535 & 913 & -814 & 222 & -25 & 1 \\
423 & 929 & -814 & 222 & -25 & 1 \\
455 & 929 & -814 & 222 & -25 & 1 \\
343 & 945 & -814 & 222 & -25 & 1 \\
231 & 961 & -814 & 222 & -25 & 1 \\
975 & 785 & -806 & 222 & -25 & 1 \\
895 & 801 & -806 & 222 & -25 & 1 \\
815 & 817 & -806 & 222 & -25 & 1 \\
703 & 833 & -806 & 222 & -25 & 1 \\
735 & 833 & -806 & 222 & -25 & 1 \\
623 & 849 & -806 & 222 & -25 & 1 \\
511 & 865 & -806 & 222 & -25 & 1 \\
1175 & 705 & -798 & 222 & -25 & 1 \\
1095 & 721 & -798 & 222 & -25 & 1 \\
983 & 737 & -798 & 222 & -25 & 1 \\
1015 & 737 & -798 & 222 & -25 & 1 \\
903 & 753 & -798 & 222 & -25 & 1 \\
1375 & 625 & -790 & 222 & -25 & 1 \\
1295 & 641 & -790 & 222 & -25 & 1 \\
1183 & 657 & -790 & 222 & -25 & 1 \\
1655 & 529 & -782 & 222 & -25 & 1 \\
1575 & 545 & -782 & 222 & -25 & 1 \\
1463 & 561 & -782 & 222 & -25 & 1 \\
1855 & 449 & -774 & 222 & -25 & 1 \\
2135 & 353 & -766 & 222 & -25 & 1
\end{pmatrix}$$

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

$$\{-2925, 30\,925, -23\,854, 6438, -725, 29\}$$

```
FindInstance[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 && n[6] ≥ 0 &&
  n[7] ≥ 0 && n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 && n[12] ≥ 0 && n[13] ≥ 0 &&
  n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && n[17] ≥ 0 && n[18] ≥ 0 && n[19] ≥ 0 && n[20] ≥ 0 &&
  n[21] ≥ 0 && n[22] ≥ 0 && n[23] ≥ 0 && n[24] ≥ 0 && n[25] ≥ 0 && n[26] ≥ 0 &&
  n[27] ≥ 0 && n[28] ≥ 0 && n[29] ≥ 0 && n[30] ≥ 0 && n[31] ≥ 0 && n[32] ≥ 0 &&
  n[33] ≥ 0 && n[34] ≥ 0 && n[35] ≥ 0 && n[36] ≥ 0 && n[37] ≥ 0 && n[38] ≥ 0 &&
  n[39] ≥ 0 && n[40] ≥ 0 && n[41] ≥ 0 && Array[n, 41].A == g, Array[n, 41], Integers]
```

```
{{n[1] → 0, n[2] → 0, n[3] → 6, n[4] → 0, n[5] → 0, n[6] → 0, n[7] → 0,
  n[8] → 0, n[9] → 0, n[10] → 0, n[11] → 0, n[12] → 0, n[13] → 21, n[14] → 0,
  n[15] → 0, n[16] → 0, n[17] → 0, n[18] → 0, n[19] → 0, n[20] → 0, n[21] → 0,
  n[22] → 2, n[23] → 0, n[24] → 0, n[25] → 0, n[26] → 0, n[27] → 0, n[28] → 0,
  n[29] → 0, n[30] → 0, n[31] → 0, n[32] → 0, n[33] → 0, n[34] → 0, n[35] → 0,
  n[36] → 0, n[37] → 0, n[38] → 0, n[39] → 0, n[40] → 0, n[41] → 0}}
```

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

```
{-137 c[1] + 1121 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],
 -249 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6],
 -217 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6],
 -329 c[1] + 1153 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6],
 223 c[1] + 1009 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],
 143 c[1] + 1025 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],
 31 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6],
 63 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6],
 -49 c[1] + 1057 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6],
 -161 c[1] + 1073 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],
 503 c[1] + 913 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],
 423 c[1] + 929 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],
 343 c[1] + 945 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 231 c[1] + 961 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6],
 975 c[1] + 785 c[2] - 806 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],
 703 c[1] + 833 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],
 623 c[1] + 849 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 511 c[1] + 865 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6],
 1175 c[1] + 705 c[2] - 798 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],
 983 c[1] + 737 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],
 903 c[1] + 753 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6],
 1375 c[1] + 625 c[2] - 790 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],
 1183 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6],
 1655 c[1] + 529 c[2] - 782 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],
 1463 c[1] + 561 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],
 2135 c[1] + 353 c[2] - 766 c[3] + 222 c[4] - 25 c[5] + c[6]}
```

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

```
-2925 c[1] + 30 925 c[2] - 23 854 c[3] + 6438 c[4] - 725 c[5] + 29 c[6]
```

```
warrant1 = Flatten[Array[c, 6] /. FindInstance[
     -2925 c[1] + 30 925 c[2] - 23 854 c[3] + 6438 c[4] - 725 c[5] + 29 c[6] < 0 &&
      -137 c[1] + 1121 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 &&
      -249 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] < 0 &&
      -217 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -329 c[1] + 1153 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      223 c[1] + 1009 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 &&
      143 c[1] + 1025 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 &&
      31 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      63 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -49 c[1] + 1057 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -161 c[1] + 1073 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 &&
      503 c[1] + 913 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 &&
      423 c[1] + 929 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 &&
      343 c[1] + 945 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      231 c[1] + 961 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      975 c[1] + 785 c[2] - 806 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 &&
      703 c[1] + 833 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 &&
      623 c[1] + 849 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      511 c[1] + 865 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1175 c[1] + 705 c[2] - 798 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 &&
      983 c[1] + 737 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 &&
      903 c[1] + 753 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1375 c[1] + 625 c[2] - 790 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 &&
      1183 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1655 c[1] + 529 c[2] - 782 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 &&
      1463 c[1] + 561 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 && 2135 c[1] +
        353 c[2] - 766 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
{2066, 12 395, 80 553, 0, 0, 53 248 032}
```

```
GCD[2066, 12 395, 80 553, 0, 0, 53 248 032]
```

```
1
```

```
Reverse[warrant1]
```

```
{53 248 032, 0, 0, 80 553, 12 395, 2066}
```

```
warrant1.g
```

```
-46 009
```

```
warrant1.Transpose[A]
```

```
{795, 66 907, -32 277, 33 835, 763, 739, 66 851, 33 779, 99 891, 707, 66 819, 33 747, 675,
 33 755, 66 795, 33 723, 99 835, 66 763, 132 875, 99 803, 66 731, 66 739, 99 779,
 132 819, 99 747, 165 859, 132 787, 99 715, 132 763, 165 803, 132 731, 198 843,
 165 771, 198 787, 231 827, 198 755, 231 771, 264 811, 231 739, 297 795, 330 779}
```

```
warrant2 = Flatten[Array[c, 6] /. FindInstance[
     -2925 c[1] + 30 925 c[2] - 23 854 c[3] + 6438 c[4] - 725 c[5] + 29 c[6] < 0 &&
      -137 c[1] + 1121 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 &&
      -249 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -217 c[1] + 1137 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -329 c[1] + 1153 c[2] - 830 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      223 c[1] + 1009 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 &&
      143 c[1] + 1025 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 &&
      31 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      63 c[1] + 1041 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -49 c[1] + 1057 c[2] - 822 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -161 c[1] + 1073 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 &&
      503 c[1] + 913 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 &&
      423 c[1] + 929 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 &&
      343 c[1] + 945 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      231 c[1] + 961 c[2] - 814 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      975 c[1] + 785 c[2] - 806 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 &&
      703 c[1] + 833 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 &&
      623 c[1] + 849 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      511 c[1] + 865 c[2] - 806 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1175 c[1] + 705 c[2] - 798 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 &&
      983 c[1] + 737 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 &&
      903 c[1] + 753 c[2] - 798 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1375 c[1] + 625 c[2] - 790 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 &&
      1183 c[1] + 657 c[2] - 790 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0 &&
      1655 c[1] + 529 c[2] - 782 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 &&
      1463 c[1] + 561 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 && 2135 c[1] +
        353 c[2] - 766 c[3] + 222 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
{101, 329, 416, 0, 0, 0}
```

```
GCD[101, 329, 416, 0, 0, 0]
```

```
1
```

```
Reverse[warrant2]
```

```
{0, 0, 0, 416, 329, 101}
```

```
warrant2.g
```

```
-44 364
```

```
warrant2.Transpose[A]
```

```
{9692, 12 924, 3644, 6876, 828, 12 532, 15 764, 9716, 12 948, 3668,
 6900, 852, -5196, 21 420, 18 604, 12 556, 15 788, 9740, 12 972, 6924, 876,
 21 444, 18 628, 15 812, 9764, 12 996, 6948, 900, 18 652, 15 836, 9788,
 13 020, 6972, 15 860, 13 044, 6996, 15 884, 13 068, 7020, 13 092, 13 116}
```

```
feasibleinterlacingpolylist[chi]
```

$$\{(-9+x)(-7+x)(-5+x)^2(1+x),$$
$$-137+1121x-830x^2+222x^3-25x^4+x^5,\ (-7+x)(-5+x)(-3+x)(1-10x+x^2),$$
$$-249+1137x-830x^2+222x^3-25x^4+x^5,\ (-7+x)(31-158x+96x^2-18x^3+x^4),$$
$$(-7+x)(47-158x+96x^2-18x^3+x^4),\ 223+1009x-822x^2+222x^3-25x^4+x^5,$$
$$(-5+x)(-51-212x+122x^2-20x^3+x^4),\ 143+1025x-822x^2+222x^3-25x^4+x^5,$$
$$(-7+x)(-5+x)(5+31x-13x^2+x^3),\ 31+1041x-822x^2+222x^3-25x^4+x^5,$$
$$(-7+x)(-3+x)(3+51x-15x^2+x^3),\ (-7+x)(7-150x+96x^2-18x^3+x^4),$$
$$(-7+x)(23-12x+x^2)(1-6x+x^2),\ (-5+x)(-139-204x+122x^2-20x^3+x^4),$$
$$(-5+x)(41-14x+x^2)(-3-6x+x^2),\ 503+913x-814x^2+222x^3-25x^4+x^5,$$
$$(-5+x)(-107-204x+122x^2-20x^3+x^4),\ 423+929x-814x^2+222x^3-25x^4+x^5,$$
$$(-7+x)(-5+x)(13+31x-13x^2+x^3),\ (-7+x)(-49-142x+96x^2-18x^3+x^4),$$
$$(-7+x)(-3+x)(11+51x-15x^2+x^3),\ (-5+x)^2(39+47x-15x^2+x^3),$$
$$(-5+x)(-179-196x+122x^2-20x^3+x^4),\ (-5+x)(-163-196x+122x^2-20x^3+x^4),$$
$$703+833x-806x^2+222x^3-25x^4+x^5,\ (-7+x)(-5+x)(21+31x-13x^2+x^3),$$
$$(-7+x)(-89-134x+96x^2-18x^3+x^4),\ (-7+x)(-73-134x+96x^2-18x^3+x^4),$$
$$(-5+x)^2(47+47x-15x^2+x^3),\ (-5+x)(-219-188x+122x^2-20x^3+x^4),$$
$$983+737x-798x^2+222x^3-25x^4+x^5,\ (-7+x)(-5+x)(29+31x-13x^2+x^3),$$
$$(-7+x)(-129-126x+96x^2-18x^3+x^4),\ (-5+x)^2(55+47x-15x^2+x^3),$$
$$(-7+x)(-5+x)(37+31x-13x^2+x^3),\ (-7+x)(-169-118x+96x^2-18x^3+x^4),$$
$$(-5+x)(-331-172x+122x^2-20x^3+x^4),\ (-7+x)(-209-110x+96x^2-18x^3+x^4),$$
$$(-7+x)(-5+x)(53+31x-13x^2+x^3),\ (-7+x)(-5+x)(61+31x-13x^2+x^3)\}$$

```
list = {(-9 + x) (-7 + x) (-5 + x)^2 (1 + x),
    -137 + 1121 x - 830 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (-5 + x) (-3 + x) (1 - 10 x + x^2),
    -249 + 1137 x - 830 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (31 - 158 x + 96 x^2 - 18 x^3 + x^4),
    (-7 + x) (47 - 158 x + 96 x^2 - 18 x^3 + x^4), 223 + 1009 x - 822 x^2 + 222 x^3 - 25 x^4 + x^5,
    (-5 + x) (-51 - 212 x + 122 x^2 - 20 x^3 + x^4), 143 + 1025 x - 822 x^2 + 222 x^3 - 25 x^4 + x^5,
    (-7 + x) (-5 + x) (5 + 31 x - 13 x^2 + x^3), 31 + 1041 x - 822 x^2 + 222 x^3 - 25 x^4 + x^5,
    (-7 + x) (-3 + x) (3 + 51 x - 15 x^2 + x^3), (-7 + x) (7 - 150 x + 96 x^2 - 18 x^3 + x^4),
    (-7 + x) (23 - 12 x + x^2) (1 - 6 x + x^2), (-5 + x) (-139 - 204 x + 122 x^2 - 20 x^3 + x^4),
    (-5 + x) (41 - 14 x + x^2) (-3 - 6 x + x^2), 503 + 913 x - 814 x^2 + 222 x^3 - 25 x^4 + x^5,
    (-5 + x) (-107 - 204 x + 122 x^2 - 20 x^3 + x^4), 423 + 929 x - 814 x^2 + 222 x^3 - 25 x^4 + x^5,
    (-7 + x) (-5 + x) (13 + 31 x - 13 x^2 + x^3), (-7 + x) (-49 - 142 x + 96 x^2 - 18 x^3 + x^4),
    (-7 + x) (-3 + x) (11 + 51 x - 15 x^2 + x^3), (-5 + x)^2 (39 + 47 x - 15 x^2 + x^3),
    (-5 + x) (-179 - 196 x + 122 x^2 - 20 x^3 + x^4), (-5 + x) (-163 - 196 x + 122 x^2 - 20 x^3 + x^4),
    703 + 833 x - 806 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (-5 + x) (21 + 31 x - 13 x^2 + x^3),
    (-7 + x) (-89 - 134 x + 96 x^2 - 18 x^3 + x^4), (-7 + x) (-73 - 134 x + 96 x^2 - 18 x^3 + x^4),
    (-5 + x)^2 (47 + 47 x - 15 x^2 + x^3), (-5 + x) (-219 - 188 x + 122 x^2 - 20 x^3 + x^4),
    983 + 737 x - 798 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (-5 + x) (29 + 31 x - 13 x^2 + x^3),
    (-7 + x) (-129 - 126 x + 96 x^2 - 18 x^3 + x^4), (-5 + x)^2 (55 + 47 x - 15 x^2 + x^3),
    (-7 + x) (-5 + x) (37 + 31 x - 13 x^2 + x^3), (-7 + x) (-169 - 118 x + 96 x^2 - 18 x^3 + x^4),
    (-5 + x) (-331 - 172 x + 122 x^2 - 20 x^3 + x^4), (-7 + x) (-209 - 110 x + 96 x^2 - 18 x^3 + x^4),
    (-7 + x) (-5 + x) (53 + 31 x - 13 x^2 + x^3), (-7 + x) (-5 + x) (61 + 31 x - 13 x^2 + x^3)};

warrantpoly =
  {-249 + 1137 x - 830 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (23 - 12 x + x^2) (1 - 6 x + x^2)}
{-249 + 1137 x - 830 x^2 + 222 x^3 - 25 x^4 + x^5, (-7 + x) (23 - 12 x + x^2) (1 - 6 x + x^2)}

anglesquared = anglesquaredmat[chi, list] // FullSimplify;

anglesquared // MatrixForm
```

$$\begin{pmatrix}
\frac{35}{73} & \text{Root}\left[-25+534\,\#1-3534\,\#1^2+6789\,\#1^3\,\&,\,3\right] & 0 & \text{Root}\left[-25+534\,\#1-\right. \\
\frac{2281}{4380} & \text{Root}\left[-1+1053\,\#1-24\,840\,\#1^2+94\,608\,\#1^3\,\&,\,2\right] & \frac{2}{15} & \text{Root}\left[-1+1053\,\#1-2\right. \\
\frac{38}{73} & \text{Root}\left[-1+195\,\#1-3255\,\#1^2+6789\,\#1^3\,\&,\,2\right] & 0 & \text{Root}\left[-1+195\,\#1-\right. \\
\frac{2287}{4380} & \text{Root}\left[-53+9513\,\#1-374\,976\,\#1^2+2\,932\,848\,\#1^3\,\&,\,2\right] & \frac{4}{15} & \text{Root}\left[-53+9513\,\#1-37\right. \\
\frac{381}{730} & \text{Root}\left[-97+10\,791\,\#1-252\,774\,\#1^2+733\,212\,\#1^3\,\&,\,2\right] & \frac{2}{15} & \text{Root}\left[-97+10\,791\,\#1-2\right. \\
\frac{191}{365} & \text{Root}\left[-5+936\,\#1-38\,502\,\#1^2+183\,303\,\#1^3\,\&,\,1\right] & \frac{4}{15} & \text{Root}\left[-5+936\,\#1-38\right. \\
\frac{1123}{2190} & \text{Root}\left[-37+6633\,\#1-137\,268\,\#1^2+733\,212\,\#1^3\,\&,\,3\right] & \frac{2}{15} & \text{Root}\left[-37+6633\,\#1-1\right. \\
\frac{449}{876} & \text{Root}\left[-353+36\,117\,\#1-395\,064\,\#1^2+977\,616\,\#1^3\,\&,\,2\right] & 0 & \text{Root}\left[-353+36\,117\,\#1-\right. \\
\frac{2251}{4380} & \text{Root}\left[-769+56\,061\,\#1-790\,128\,\#1^2+2\,932\,848\,\#1^3\,\&,\,2\right] & \frac{2}{15} & \text{Root}\left[-769+56\,061\,\#1-7\right. \\
\frac{75}{146} & \text{Root}\left[-205+11\,619\,\#1-118\,854\,\#1^2+244\,404\,\#1^3\,\&,\,2\right] & 0 & \text{Root}\left[-205+11\,619\,\#1-\right. \\
\frac{2257}{4380} & \text{Root}\left[-215+16\,659\,\#1-395\,064\,\#1^2+2\,932\,848\,\#1^3\,\&,\,3\right] & \frac{4}{15} & \text{Root}\left[-215+16\,659\,\#1-3\right. \\
\frac{188}{365} & \text{Root}\left[-100+5130\,\#1-64\,449\,\#1^2+183\,303\,\#1^3\,\&,\,2\right] & \frac{2}{15} & \text{Root}\left[-100+5130\,\#1-\right. \\
\frac{377}{730} & \text{Root}\left[-167+9405\,\#1-159\,030\,\#1^2+733\,212\,\#1^3\,\&,\,2\right] & \frac{4}{15} & \text{Root}\left[-167+9405\,\#1-1\right.
\end{pmatrix}$$

$\frac{189}{365}$	$\text{Root}\left[-1+126\,\#1-5022\,\#1^2+61\,101\,\#1^3\,\&,\,1\right]$	$\frac{2}{5}$	$\text{Root}\left[-1+126\,\#1-5$
$\frac{147}{292}$	$\text{Root}\left[-47+10\,683\,\#1-241\,056\,\#1^2+977\,616\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-47+10\,683\,\#1-2$
$\frac{221}{438}$	$\text{Root}\left[-97+7137\,\#1-80\,352\,\#1^2+244\,404\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-97+7137\,\#1-8$
$\frac{554}{1095}$	$\text{Root}\left[-61+5535\,\#1-142\,290\,\#1^2+733\,212\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-61+5535\,\#1-1$
$\frac{443}{876}$	$\text{Root}\left[-325+15\,081\,\#1-133\,920\,\#1^2+325\,872\,\#1^3\,\&,\,2\right]$	0	$\text{Root}\left[-325+15\,081\,\#1-$
$\frac{2221}{4380}$	$\text{Root}\left[-1483+67\,167\,\#1-810\,216\,\#1^2+2\,932\,848\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-1483+67\,167\,\#1-$
$\frac{37}{73}$	$\text{Root}\left[-107+3798\,\#1-30\,132\,\#1^2+61\,101\,\#1^3\,\&,\,2\right]$	0	$\text{Root}\left[-107+3798\,\#1-$
$\frac{371}{730}$	$\text{Root}\left[-769+27\,171\,\#1-262\,818\,\#1^2+733\,212\,\#1^3\,\&,\,2\right]$	$\frac{2}{15}$	$\text{Root}\left[-769+27\,171\,\#1-$
$\frac{186}{365}$	$\text{Root}\left[-71+2997\,\#1-41\,013\,\#1^2+183\,303\,\#1^3\,\&,\,3\right]$	$\frac{4}{15}$	$\text{Root}\left[-71+2997\,\#1-4$
$\frac{145}{292}$	$\text{Root}\left[-1+597\,\#1-27\,528\,\#1^2+108\,624\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-1+597\,\#1-27$
$\frac{109}{219}$	$\text{Root}\left[-155+7101\,\#1-82\,026\,\#1^2+244\,404\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-155+7101\,\#1-$
$\frac{437}{876}$	$\text{Root}\left[-1525+50\,265\,\#1-408\,456\,\#1^2+977\,616\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-1525+50\,265\,\#1-$
$\frac{2191}{4380}$	$\text{Root}\left[-1597+65\,961\,\#1-830\,304\,\#1^2+2\,932\,848\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-1597+65\,961\,\#1-$
$\frac{1}{2}$	$\text{Root}\left[-1+27\,\#1-186\,\#1^2+372\,\#1^3\,\&,\,2\right]$	0	$\text{Root}\left[-1+27\,\#1-$
$\frac{183}{365}$	$\text{Root}\left[-265+7686\,\#1-66\,960\,\#1^2+183\,303\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-265+7686\,\#1-$
$\frac{367}{730}$	$\text{Root}\left[-227+11\,493\,\#1-169\,074\,\#1^2+733\,212\,\#1^3\,\&,\,3\right]$	$\frac{4}{15}$	$\text{Root}\left[-227+11\,493\,\#1-$
$\frac{215}{438}$	$\text{Root}\left[-41+2013\,\#1-27\,900\,\#1^2+81\,468\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-41+2013\,\#1-$
$\frac{431}{876}$	$\text{Root}\left[-1811+51\,183\,\#1-415\,152\,\#1^2+977\,616\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-1811+51\,183\,\#1-$
$\frac{2161}{4380}$	$\text{Root}\left[-535+52\,443\,\#1-850\,392\,\#1^2+2\,932\,848\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-535+52\,443\,\#1-8$
$\frac{36}{73}$	$\text{Root}\left[-211+4815\,\#1-30\,969\,\#1^2+61\,101\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-211+4815\,\#1-$
$\frac{361}{730}$	$\text{Root}\left[-1129+31\,239\,\#1-272\,862\,\#1^2+733\,212\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-1129+31\,239\,\#1-$
$\frac{425}{876}$	$\text{Root}\left[-547+15\,999\,\#1-140\,616\,\#1^2+325\,872\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-547+15\,999\,\#1-$
$\frac{71}{146}$	$\text{Root}\left[-941+19\,755\,\#1-125\,550\,\#1^2+244\,404\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-941+19\,755\,\#1-$
$\frac{178}{365}$	$\text{Root}\left[-208+7164\,\#1-69\,471\,\#1^2+183\,303\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-208+7164\,\#1-$
$\frac{419}{876}$	$\text{Root}\left[-823+40\,707\,\#1-428\,544\,\#1^2+977\,616\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-823+40\,707\,\#1-$
$\frac{351}{730}$	$\text{Root}\left[-25+22\,995\,\#1-282\,906\,\#1^2+733\,212\,\#1^3\,\&,\,3\right]$	$\frac{2}{15}$	$\text{Root}\left[-25+22\,995\,\#1-2$
$\frac{69}{146}$	$\text{Root}\left[-673+17\,667\,\#1-128\,898\,\#1^2+244\,404\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-673+17\,667\,\#1-$
$\frac{34}{73}$	$\text{Root}\left[-53+3771\,\#1-32\,643\,\#1^2+61\,101\,\#1^3\,\&,\,3\right]$	0	$\text{Root}\left[-53+3771\,\#1-$

```
combinations[chi, (x + 5) (x - 5), warrantpoly[[1]],
  warrantpoly[[2]], list, anglesquared] // FullSimplify
```

$$\{\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 6],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 2],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 6],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 2],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 5],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 1],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 5],$$
$$\text{Root}[3\,115\,225 - 15\,630\,756\,\#1^2 + 16\,570\,710\,\#1^4 - 6\,177\,060\,\#1^6 + 700\,569\,\#1^8\,\&, 1]\}$$

```
compatible[combinations[chi, (x + 5) (x - 5),
   warrantpoly[[1]], warrantpoly[[2]], list, anglesquared] // FullSimplify]
```

```
0
```

In[ ]:=
```
chi = (-5 + x)^11 (-3 + x) (5 + x)^15 (68 - 17 x + x^2)
```

Out[ ]=
$$(-5+x)^{11}\,(-3+x)\,(5+x)^{15}\,\left(68-17\,x+x^2\right)$$

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

```
{{-75, -220, 122, -20, 1}, {-59, -220, 122, -20, 1},
 {-43, -220, 122, -20, 1}, {-27, -220, 122, -20, 1}, {93, -244, 122, -20, 1},
 {5, -236, 122, -20, 1}, {21, -236, 122, -20, 1}, {37, -236, 122, -20, 1},
 {53, -236, 122, -20, 1}, {69, -236, 122, -20, 1}, {-35, -228, 122, -20, 1},
 {-19, -228, 122, -20, 1}, {-3, -228, 122, -20, 1}, {13, -228, 122, -20, 1},
 {29, -228, 122, -20, 1}, {-115, -212, 122, -20, 1}, {-99, -212, 122, -20, 1},
 {-83, -212, 122, -20, 1}, {-155, -204, 122, -20, 1}, {-139, -204, 122, -20, 1},
 {-195, -196, 122, -20, 1}, {-179, -196, 122, -20, 1}, {-235, -188, 122, -20, 1}}
```

```
A = {{93, -244, 122, -20, 1}, {5, -236, 122, -20, 1}, {21, -236, 122, -20, 1},
   {37, -236, 122, -20, 1}, {53, -236, 122, -20, 1}, {69, -236, 122, -20, 1},
   {-35, -228, 122, -20, 1}, {-19, -228, 122, -20, 1}, {-3, -228, 122, -20, 1},
   {13, -228, 122, -20, 1}, {29, -228, 122, -20, 1}, {-75, -220, 122, -20, 1},
   {-59, -220, 122, -20, 1}, {-43, -220, 122, -20, 1}, {-27, -220, 122, -20, 1},
   {-115, -212, 122, -20, 1}, {-99, -212, 122, -20, 1}, {-83, -212, 122, -20, 1},
   {-155, -204, 122, -20, 1}, {-139, -204, 122, -20, 1}, {-195, -196, 122, -20, 1},
   {-179, -196, 122, -20, 1}, {-235, -188, 122, -20, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} 93 & -244 & 122 & -20 & 1 \\ 5 & -236 & 122 & -20 & 1 \\ 21 & -236 & 122 & -20 & 1 \\ 37 & -236 & 122 & -20 & 1 \\ 53 & -236 & 122 & -20 & 1 \\ 69 & -236 & 122 & -20 & 1 \\ -35 & -228 & 122 & -20 & 1 \\ -19 & -228 & 122 & -20 & 1 \\ -3 & -228 & 122 & -20 & 1 \\ 13 & -228 & 122 & -20 & 1 \\ 29 & -228 & 122 & -20 & 1 \\ -75 & -220 & 122 & -20 & 1 \\ -59 & -220 & 122 & -20 & 1 \\ -43 & -220 & 122 & -20 & 1 \\ -27 & -220 & 122 & -20 & 1 \\ -115 & -212 & 122 & -20 & 1 \\ -99 & -212 & 122 & -20 & 1 \\ -83 & -212 & 122 & -20 & 1 \\ -155 & -204 & 122 & -20 & 1 \\ -139 & -204 & 122 & -20 & 1 \\ -195 & -196 & 122 & -20 & 1 \\ -179 & -196 & 122 & -20 & 1 \\ -235 & -188 & 122 & -20 & 1 \end{pmatrix}$$

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

```
{1105, -6684, 3538, -580, 29}
```

```
FindInstance[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 && n[6] ≥ 0 &&
  n[7] ≥ 0 && n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 && n[12] ≥ 0 && n[13] ≥ 0 &&
  n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && n[17] ≥ 0 && n[18] ≥ 0 && n[19] ≥ 0 && n[20] ≥ 0 &&
  n[21] ≥ 0 && n[22] ≥ 0 && n[23] ≥ 0 && Array[n, 23].A == g, Array[n, 23], Integers]
```

```
{{n[1] → 0, n[2] → 0, n[3] → 0, n[4] → 0, n[5] → 0, n[6] → 14, n[7] → 0, n[8] → 0,
  n[9] → 0, n[10] → 1, n[11] → 9, n[12] → 0, n[13] → 0, n[14] → 0, n[15] → 5, n[16] → 0,
  n[17] → 0, n[18] → 0, n[19] → 0, n[20] → 0, n[21] → 0, n[22] → 0, n[23] → 0}}
```

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

$$\begin{aligned}
&\{93\,c[1]-244\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 5\,c[1]-236\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 21\,c[1]-236\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 37\,c[1]-236\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 53\,c[1]-236\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 69\,c[1]-236\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -35\,c[1]-228\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -19\,c[1]-228\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -3\,c[1]-228\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 13\,c[1]-228\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ 29\,c[1]-228\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -75\,c[1]-220\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -59\,c[1]-220\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -43\,c[1]-220\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -27\,c[1]-220\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -115\,c[1]-212\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -99\,c[1]-212\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -83\,c[1]-212\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -155\,c[1]-204\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -139\,c[1]-204\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -195\,c[1]-196\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -179\,c[1]-196\,c[2]+122\,c[3]-20\,c[4]+c[5],\\
&\ -235\,c[1]-188\,c[2]+122\,c[3]-20\,c[4]+c[5]\}
\end{aligned}$$

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

$$1105\,c[1]-6684\,c[2]+3538\,c[3]-580\,c[4]+29\,c[5]$$

```
warrant = Flatten[Array[c, 5] /.
    FindInstance[1105 c[1] - 6684 c[2] + 3538 c[3] - 580 c[4] + 29 c[5] < 0 &&
      93 c[1] - 244 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      5 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      21 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      37 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      53 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      69 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -35 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -19 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -3 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      13 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      29 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] < 0 &&
      -75 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -59 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -43 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -27 c[1] - 220 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -115 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -99 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -83 c[1] - 212 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -155 c[1] - 204 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      -139 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 &&
      -235 c[1] - 188 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
{-190, -1143, 0, 0, -256 444}

GCD[-190, -1143, 0, 0, -256 444]
1

Reverse[warrant]
{-256 444, 0, 0, -1143, -190}

warrant.g
-7014

warrant.Transpose[A]
{4778, 12 354, 9314, 6274, 3234, 194, 10 810, 7770, 4730, 1690, -1350,
 9266, 6226, 3186, 146, 7722, 4682, 1642, 6178, 3138, 4634, 1594, 3090}
```

```
feasibleinterlacingpolylist[chi]
```

$$\{(-5+x)^2\,(-3-10\,x+x^2),\ (59-16\,x+x^2)\,(-1-4\,x+x^2),$$
$$-43-220\,x+122\,x^2-20\,x^3+x^4,\ -27-220\,x+122\,x^2-20\,x^3+x^4,$$
$$(-3+x)\,(-31+71\,x-17\,x^2+x^3),\ (-5+x)\,(-1+47\,x-15\,x^2+x^3),$$
$$21-236\,x+122\,x^2-20\,x^3+x^4,\ (37-14\,x+x^2)\,(1-6\,x+x^2),\ 53-236\,x+122\,x^2-20\,x^3+x^4,$$
$$(-3+x)\,(-23+71\,x-17\,x^2+x^3),\ (-5+x)\,(7+47\,x-15\,x^2+x^3),$$
$$-19-228\,x+122\,x^2-20\,x^3+x^4,\ -3-228\,x+122\,x^2-20\,x^3+x^4,$$
$$13-228\,x+122\,x^2-20\,x^3+x^4,\ 29-228\,x+122\,x^2-20\,x^3+x^4,$$
$$(-5+x)\,(23+47\,x-15\,x^2+x^3),\ -99-212\,x+122\,x^2-20\,x^3+x^4,$$
$$-83-212\,x+122\,x^2-20\,x^3+x^4,\ (-5+x)\,(31+47\,x-15\,x^2+x^3),$$
$$-139-204\,x+122\,x^2-20\,x^3+x^4,\ (-5+x)\,(39+47\,x-15\,x^2+x^3),$$
$$-179-196\,x+122\,x^2-20\,x^3+x^4,\ (-5+x)\,(47+47\,x-15\,x^2+x^3)\}$$

In[ ]:=
```
list =
  {(-5 + x)^2 (-3 - 10 x + x^2), (59 - 16 x + x^2) (-1 - 4 x + x^2), -43 - 220 x + 122 x^2 - 20 x^3 + x^4,
   -27 - 220 x + 122 x^2 - 20 x^3 + x^4, (-3 + x) (-31 + 71 x - 17 x^2 + x^3),
   (-5 + x) (-1 + 47 x - 15 x^2 + x^3), 21 - 236 x + 122 x^2 - 20 x^3 + x^4,
   (37 - 14 x + x^2) (1 - 6 x + x^2), 53 - 236 x + 122 x^2 - 20 x^3 + x^4,
   (-3 + x) (-23 + 71 x - 17 x^2 + x^3), (-5 + x) (7 + 47 x - 15 x^2 + x^3),
   -19 - 228 x + 122 x^2 - 20 x^3 + x^4, -3 - 228 x + 122 x^2 - 20 x^3 + x^4,
   13 - 228 x + 122 x^2 - 20 x^3 + x^4, 29 - 228 x + 122 x^2 - 20 x^3 + x^4,
   (-5 + x) (23 + 47 x - 15 x^2 + x^3), -99 - 212 x + 122 x^2 - 20 x^3 + x^4,
   -83 - 212 x + 122 x^2 - 20 x^3 + x^4, (-5 + x) (31 + 47 x - 15 x^2 + x^3),
   -139 - 204 x + 122 x^2 - 20 x^3 + x^4, (-5 + x) (39 + 47 x - 15 x^2 + x^3),
   -179 - 196 x + 122 x^2 - 20 x^3 + x^4, (-5 + x) (47 + 47 x - 15 x^2 + x^3)};
```

```
warrantpoly = 29 - 228 x + 122 x^2 - 20 x^3 + x^4
```

$$29-228\,x+122\,x^2-20\,x^3+x^4$$

In[ ]:=
```
chi
```

Out[ ]=
$$(-5+x)^{11}\,(-3+x)\,(5+x)^{15}\,(68-17\,x+x^2)$$

In[ ]:=
```
orderedroots[minipoly[chi]]
```

Out[ ]=
$$\left\{-5,\ 3,\ 5,\ \frac{1}{2}\left(17-\sqrt{17}\right),\ \frac{1}{2}\left(17+\sqrt{17}\right)\right\}$$

```
{2}
{4, 5}
{2, 4, 5}
```

In[ ]:=
```
anglesquared = anglesquaredmat[chi, list] // FullSimplify;
```

In[ ]:= **anglesquared // MatrixForm**

Out[ ]//MatrixForm=

$$\begin{pmatrix}
\frac{45}{89} & \frac{3}{13} & 0 & \frac{5185+937\sqrt{17}}{39338} & \frac{5185-937\sqrt{17}}{39338} \\
\frac{451}{890} & \frac{5}{26} & \frac{1}{10} & \frac{7905+1163\sqrt{17}}{78676} & \frac{7905-1163\sqrt{17}}{78676} \\
\frac{226}{445} & \frac{2}{13} & \frac{1}{5} & \frac{1360+113\sqrt{17}}{19669} & \frac{1360-113\sqrt{17}}{19669} \\
\frac{453}{890} & \frac{3}{26} & \frac{3}{10} & -\frac{7\left(-425+37\sqrt{17}\right)}{78676} & \frac{7\left(425+37\sqrt{17}\right)}{78676} \\
\frac{234}{445} & 0 & \frac{3}{10} & \frac{527+125\sqrt{17}}{6052} & \frac{527-125\sqrt{17}}{6052} \\
\frac{46}{89} & \frac{2}{13} & 0 & \frac{6477+1565\sqrt{17}}{39338} & \frac{6477-1565\sqrt{17}}{39338} \\
\frac{461}{890} & \frac{3}{26} & \frac{1}{10} & \frac{10489+2419\sqrt{17}}{78676} & \frac{10489-2419\sqrt{17}}{78676} \\
\frac{231}{445} & \frac{1}{13} & \frac{1}{5} & \frac{2006+427\sqrt{17}}{19669} & \frac{2006-427\sqrt{17}}{19669} \\
\frac{463}{890} & \frac{1}{26} & \frac{3}{10} & \frac{5559+997\sqrt{17}}{78676} & \frac{5559-997\sqrt{17}}{78676} \\
\frac{232}{445} & 0 & \frac{2}{5} & \frac{119+11\sqrt{17}}{3026} & \frac{119-11\sqrt{17}}{3026} \\
\frac{91}{178} & \frac{5}{26} & 0 & \frac{5831+1251\sqrt{17}}{39338} & \frac{5831-1251\sqrt{17}}{39338} \\
\frac{228}{445} & \frac{2}{13} & \frac{1}{10} & \frac{9197+1791\sqrt{17}}{78676} & \frac{9197-1791\sqrt{17}}{78676} \\
\frac{457}{890} & \frac{3}{26} & \frac{1}{5} & \frac{9\left(187+30\sqrt{17}\right)}{19669} & -\frac{9\left(-187+30\sqrt{17}\right)}{19669} \\
\frac{229}{445} & \frac{1}{13} & \frac{3}{10} & \frac{4267+369\sqrt{17}}{78676} & \frac{4267-369\sqrt{17}}{78676} \\
\frac{459}{890} & \frac{1}{26} & \frac{2}{5} & \frac{901-171\sqrt{17}}{39338} & \frac{901+171\sqrt{17}}{39338} \\
\frac{1}{2} & \frac{7}{26} & 0 & \frac{1}{442}\left(51+7\sqrt{17}\right) & \frac{1}{442}\left(51-7\sqrt{17}\right) \\
\frac{223}{445} & \frac{3}{13} & \frac{1}{10} & \frac{6613+535\sqrt{17}}{78676} & \frac{6613-535\sqrt{17}}{78676} \\
\frac{447}{890} & \frac{5}{26} & \frac{1}{5} & \frac{1037-44\sqrt{17}}{19669} & \frac{1037+44\sqrt{17}}{19669} \\
\frac{44}{89} & \frac{4}{13} & 0 & \frac{3893+309\sqrt{17}}{39338} & \frac{3893-309\sqrt{17}}{39338} \\
\frac{441}{890} & \frac{7}{26} & \frac{1}{10} & \frac{5321-93\sqrt{17}}{78676} & \frac{5321+93\sqrt{17}}{78676} \\
\frac{87}{178} & \frac{9}{26} & 0 & \frac{3247-5\sqrt{17}}{39338} & \frac{3247+5\sqrt{17}}{39338} \\
\frac{218}{445} & \frac{4}{13} & \frac{1}{10} & \frac{4029-721\sqrt{17}}{78676} & \frac{4029+721\sqrt{17}}{78676} \\
\frac{43}{89} & \frac{5}{13} & 0 & \frac{2601-319\sqrt{17}}{39338} & \frac{2601+319\sqrt{17}}{39338}
\end{pmatrix}$$

In[ ]:= **anglemat = Sqrt[anglesquared] // FullSimplify;**

In[ ]:= **anglemat // MatrixForm**

Out[ ]//MatrixForm=

$3\sqrt{\frac{5}{89}}$	$\sqrt{\frac{3}{13}}$	0	$\sqrt{\frac{5185+937\sqrt{17}}{39\,338}}$	0.183...
$\sqrt{\frac{451}{890}}$	$\sqrt{\frac{5}{26}}$	$\frac{1}{\sqrt{10}}$	0.402...	0.199...
$\sqrt{\frac{226}{445}}$	$\sqrt{\frac{2}{13}}$	$\frac{1}{\sqrt{5}}$	0.305...	0.213...
$\sqrt{\frac{453}{890}}$	$\sqrt{\frac{3}{26}}$	$\sqrt{\frac{3}{10}}$	0.156...	0.227...
$3\sqrt{\frac{26}{445}}$	0	$\sqrt{\frac{3}{10}}$	0.415...	0.0438...
$\sqrt{\frac{46}{89}}$	$\sqrt{\frac{2}{13}}$	0	0.573...	0.0249...
$\sqrt{\frac{461}{890}}$	$\sqrt{\frac{3}{26}}$	$\frac{1}{\sqrt{10}}$	0.510...	0.0809...
$\sqrt{\frac{231}{445}}$	$\frac{1}{\sqrt{13}}$	$\frac{1}{\sqrt{5}}$	0.438...	0.112...
$\sqrt{\frac{463}{890}}$	$\frac{1}{\sqrt{26}}$	$\sqrt{\frac{3}{10}}$	0.351...	0.136...
$2\sqrt{\frac{58}{445}}$	0	$\sqrt{\frac{2}{5}}$	0.233...	0.156...
$\sqrt{\frac{91}{178}}$	$\sqrt{\frac{5}{26}}$	0	0.529...	0.131...
$2\sqrt{\frac{57}{445}}$	$\sqrt{\frac{2}{13}}$	$\frac{1}{\sqrt{10}}$	0.459...	0.152...
$\sqrt{\frac{457}{890}}$	$\sqrt{\frac{3}{26}}$	$\frac{1}{\sqrt{5}}$	0.377...	0.170...
$\sqrt{\frac{229}{445}}$	$\frac{1}{\sqrt{13}}$	$\sqrt{\frac{3}{10}}$	0.271...	0.187...
$3\sqrt{\frac{51}{890}}$	$\frac{1}{\sqrt{26}}$	$\sqrt{\frac{2}{5}}$	0.0706...	0.202...
$\frac{1}{\sqrt{2}}$	$\sqrt{\frac{7}{26}}$	0	$\sqrt{\frac{1}{442}\left(51+7\sqrt{17}\right)}$	0.224...
$\sqrt{\frac{223}{445}}$	$\sqrt{\frac{3}{13}}$	$\frac{1}{\sqrt{10}}$	0.335...	0.237...
$\sqrt{\frac{447}{890}}$	$\sqrt{\frac{5}{26}}$	$\frac{1}{\sqrt{5}}$	0.209...	$\sqrt{\frac{1037+44\sqrt{17}}{19\,669}}$
$2\sqrt{\frac{11}{89}}$	$\frac{2}{\sqrt{13}}$	0	$\sqrt{\frac{3893+309\sqrt{17}}{39\,338}}$	0.258...
$\frac{21}{\sqrt{890}}$	$\sqrt{\frac{7}{26}}$	$\frac{1}{\sqrt{10}}$	0.251...	0.269...
$\sqrt{\frac{87}{178}}$	$\frac{3}{\sqrt{26}}$	0	$\sqrt{\frac{3247-5\sqrt{17}}{39\,338}}$	$\sqrt{\frac{3247+5\sqrt{17}}{39\,338}}$
$\sqrt{\frac{218}{445}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{10}}$	0.116...	0.298...
$\sqrt{\frac{43}{89}}$	$\sqrt{\frac{5}{13}}$	0	0.181...	0.316...

In[ ]:= **chi**

Out[ ]= $(-5+x)^{11}\,(-3+x)\,(5+x)^{15}\left(68-17\,x+x^2\right)$

In[ ]:= **coeff[chi, (x + 5) (x - 5) (68 - 17 x + x^2)] // FullSimplify**

Out[ ]= $\{-416\}$

```
In[ ]:= coeff[chi, (x + 5) (x - 5) (x - 3)] // FullSimplify
```

$$\text{Out[ ]= } \left\{\frac{1}{2}\left(711-145\sqrt{17}\right),\ \frac{1}{2}\left(711+145\sqrt{17}\right)\right\}$$

```
In[ ]:= coeff[chi, (x + 5) (x - 5)] // FullSimplify
```

$$\text{Out[ ]= } \left\{-16,\ \frac{1}{2}\left(103-17\sqrt{17}\right),\ \frac{1}{2}\left(103+17\sqrt{17}\right)\right\}$$

```
In[ ]:= For[i = 1, i ≤ Length[list], i++,
 If[compatible[combinationangle[{-416}, {15, i}, {2}, anglemat]] == 1, Print[i]]
]
```

```
3
5
6
9
10
12
15
21
```

```
In[ ]:= For[i = 1, i ≤ Length[list], i++,
 If[compatiblefrminipoly[MinimalPolynomial[
     combinationangle[{-416}, {15, i}, {2}, anglemat], x]] == 1, Print[i]]
]
```

```
3
5
6
9
10
12
15
21
```

```
In[ ]:= MinimalPolynomial[combinationangle[
   {1/2 (711 - 145 Sqrt[17]), 1/2 (711 + 145 Sqrt[17])}, {15, 5}, {4, 5}, anglemat], x]
```

$$\text{Out[ ]= } \left\{16\,129-1234\,x^2+17\,x^4,\ 16\,129-1234\,x^2+17\,x^4\right\}$$

```
In[ ]:= For[i = 1, i ≤ Length[list], i++,
 If[compatiblefrminipoly[
    MinimalPolynomial[combinationangle[{1/2 (711 - 145 √17), 1/2 (711 + 145 √17)},
      {15, i}, {4, 5}, anglemat], x]] == 1, Print[i]]
]
```

```
6
13
15
23
```

```
In[ ]:= For[i = 1, i ≤ Length[list], i++,
 If[compatiblefrminipoly[MinimalPolynomial[
     combinationangle[{-16, 1/2 (103 - 17 √17), 1/2 (103 + 17 √17)},
      {15, i}, {2, 4, 5}, anglemat], x]] == 1, Print[i]]
]
```

```
6
15
```

```
refinedlist = {};
For[i = 1, i ≤ Length[list], i++,
 If[compatible[combinations[chi, (x + 5) (x - 5), warrantpoly, list[[i]], list,
      anglesquared] // FullSimplify] == 1, AppendTo[refinedlist, list[[i]]]]
]
refinedlist
{(-5 + x) (-1 + 47 x - 15 x^2 + x^3), 29 - 228 x + 122 x^2 - 20 x^3 + x^4}

refinedA = CoefficientList[refinedlist, x]
{{5, -236, 122, -20, 1}, {29, -228, 122, -20, 1}}

refinedA // MatrixForm
(  5  -236  122  -20  1 )
( 29  -228  122  -20  1 )

Array[c, 5].Transpose[refinedA]
{5 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5],
 29 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5]}

Array[c, 5].g
1105 c[1] - 6684 c[2] + 3538 c[3] - 580 c[4] + 29 c[5]
```

```
cert = Flatten[Array[c, 5] /.
    FindInstance[1105 c[1] - 6684 c[2] + 3538 c[3] - 580 c[4] + 29 c[5] < 0 &&
      5 c[1] - 236 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0 &&
      29 c[1] - 228 c[2] + 122 c[3] - 20 c[4] + c[5] ≥ 0, Array[c, 5], Integers]]
```

```
{-46, -7, 0, 0, 0}
```

```
GCD[-46, -7, 0, 0, 0]
```

```
1
```

```
Reverse[cert]
```

```
{0, 0, 0, -7, -46}
```

```
cert.g
```

```
-4042
```

```
cert.Transpose[refinedA]
```

```
{1422, 262}
```

```
chi = (-7 + x)^2 (-5 + x)^8 (-3 + x)^2 (5 + x)^15 (52 - 15 x + x^2)
```

```
(-7 + x)^2 (-5 + x)^8 (-3 + x)^2 (5 + x)^15 (52 - 15 x + x^2)
```

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

```
{{-525, 1405, -890, 226, -25, 1}, {-85, 1277, -882, 226, -25, 1},
 {-165, 1293, -882, 226, -25, 1}, {-245, 1309, -882, 226, -25, 1},
 {-357, 1325, -882, 226, -25, 1}, {275, 1165, -874, 226, -25, 1},
 {195, 1181, -874, 226, -25, 1}, {115, 1197, -874, 226, -25, 1},
 {35, 1213, -874, 226, -25, 1}, {475, 1085, -866, 226, -25, 1},
 {395, 1101, -866, 226, -25, 1}, {315, 1117, -866, 226, -25, 1},
 {675, 1005, -858, 226, -25, 1}, {595, 1021, -858, 226, -25, 1},
 {875, 925, -850, 226, -25, 1}, {1155, 829, -842, 226, -25, 1}}
```

```
A = {{-525, 1405, -890, 226, -25, 1}, {-85, 1277, -882, 226, -25, 1},
    {-165, 1293, -882, 226, -25, 1}, {-245, 1309, -882, 226, -25, 1},
    {-357, 1325, -882, 226, -25, 1}, {275, 1165, -874, 226, -25, 1},
    {195, 1181, -874, 226, -25, 1}, {115, 1197, -874, 226, -25, 1},
    {35, 1213, -874, 226, -25, 1}, {475, 1085, -866, 226, -25, 1},
    {395, 1101, -866, 226, -25, 1}, {315, 1117, -866, 226, -25, 1},
    {675, 1005, -858, 226, -25, 1}, {595, 1021, -858, 226, -25, 1},
    {875, 925, -850, 226, -25, 1}, {1155, 829, -842, 226, -25, 1}};
```

```
A // MatrixForm
```

$$\begin{pmatrix} -525 & 1405 & -890 & 226 & -25 & 1 \\ -85 & 1277 & -882 & 226 & -25 & 1 \\ -165 & 1293 & -882 & 226 & -25 & 1 \\ -245 & 1309 & -882 & 226 & -25 & 1 \\ -357 & 1325 & -882 & 226 & -25 & 1 \\ 275 & 1165 & -874 & 226 & -25 & 1 \\ 195 & 1181 & -874 & 226 & -25 & 1 \\ 115 & 1197 & -874 & 226 & -25 & 1 \\ 35 & 1213 & -874 & 226 & -25 & 1 \\ 475 & 1085 & -866 & 226 & -25 & 1 \\ 395 & 1101 & -866 & 226 & -25 & 1 \\ 315 & 1117 & -866 & 226 & -25 & 1 \\ 675 & 1005 & -858 & 226 & -25 & 1 \\ 595 & 1021 & -858 & 226 & -25 & 1 \\ 875 & 925 & -850 & 226 & -25 & 1 \\ 1155 & 829 & -842 & 226 & -25 & 1 \end{pmatrix}$$

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

```
{-4345, 36841, -25490, 6554, -725, 29}
```

```
Solve[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 && n[6] ≥ 0 && n[7] ≥ 0 &&
  n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 && n[12] ≥ 0 && n[13] ≥ 0 &&
  n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && Array[n, 16].A == g, Array[n, 16], Integers]
```

```
{{n[1] → 0, n[2] → 0, n[3] → 0, n[4] → 0,
  n[5] → 20, n[6] → 6, n[7] → 1, n[8] → 0, n[9] → 0, n[10] → 2,
  n[11] → 0, n[12] → 0, n[13] → 0, n[14] → 0, n[15] → 0, n[16] → 0},
 {n[1] → 0, n[2] → 0, n[3] → 0, n[4] → 0, n[5] → 20, n[6] → 7, n[7] → 0,
  n[8] → 0, n[9] → 0, n[10] → 1, n[11] → 1, n[12] → 0, n[13] → 0,
  n[14] → 0, n[15] → 0, n[16] → 0}, {n[1] → 0, n[2] → 0, n[3] → 0,
  n[4] → 0, n[5] → 20, n[6] → 7, n[7] → 1, n[8] → 0, n[9] → 0, n[10] → 0,
  n[11] → 0, n[12] → 0, n[13] → 1, n[14] → 0, n[15] → 0, n[16] → 0},
 {n[1] → 0, n[2] → 0, n[3] → 0, n[4] → 0, n[5] → 20, n[6] → 8,
  n[7] → 0, n[8] → 0, n[9] → 0, n[10] → 0, n[11] → 0,
  n[12] → 0, n[13] → 0, n[14] → 1, n[15] → 0, n[16] → 0}}
```

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

```
{-525 c[1] + 1405 c[2] - 890 c[3] + 226 c[4] - 25 c[5] + c[6],
 -85 c[1] + 1277 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6],
 -165 c[1] + 1293 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6],
 -245 c[1] + 1309 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6],
 -357 c[1] + 1325 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6],
 275 c[1] + 1165 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6],
 195 c[1] + 1181 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6],
 115 c[1] + 1197 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6],
 35 c[1] + 1213 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6],
 475 c[1] + 1085 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6],
 395 c[1] + 1101 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6],
 315 c[1] + 1117 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6],
 675 c[1] + 1005 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6],
 595 c[1] + 1021 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6],
 875 c[1] + 925 c[2] - 850 c[3] + 226 c[4] - 25 c[5] + c[6],
 1155 c[1] + 829 c[2] - 842 c[3] + 226 c[4] - 25 c[5] + c[6]}
```

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

```
-4345 c[1] + 36 841 c[2] - 25 490 c[3] + 6554 c[4] - 725 c[5] + 29 c[6]
```

```
warrant1 = Flatten[Array[c, 6] /. FindInstance[
     -4345 c[1] + 36 841 c[2] - 25 490 c[3] + 6554 c[4] - 725 c[5] + 29 c[6] < 0 &&
      -525 c[1] + 1405 c[2] - 890 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -85 c[1] + 1277 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -165 c[1] + 1293 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -245 c[1] + 1309 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      -357 c[1] + 1325 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] < 0 &&
      275 c[1] + 1165 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      195 c[1] + 1181 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      115 c[1] + 1197 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      35 c[1] + 1213 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      475 c[1] + 1085 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      395 c[1] + 1101 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      315 c[1] + 1117 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      675 c[1] + 1005 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      595 c[1] + 1021 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
      875 c[1] + 925 c[2] - 850 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 && 1155 c[1] +
        829 c[2] - 842 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{154, 507, 708, 0, 0, 0}
```

```
GCD[154, 507, 708, 0, 0, 0]
```

```
1
```

```
Reverse[warrant1]
```

```
{0, 0, 0, 708, 507, 154}
```

```
warrant1.g
```

```
-37 663
```

```
warrant1.Transpose[A]
```

```
{1365, 9893, 5685, 1477, -7659, 14 213, 10 005,
 5797, 1589, 10 117, 5909, 1701, 6021, 1813, 1925, 2037}
```

```
warrant2 = Flatten[Array[c, 6] /. FindInstance[
    -4345 c[1] + 36 841 c[2] - 25 490 c[3] + 6554 c[4] - 725 c[5] + 29 c[6] < 0 &&
     -525 c[1] + 1405 c[2] - 890 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -85 c[1] + 1277 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -165 c[1] + 1293 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -245 c[1] + 1309 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     -357 c[1] + 1325 c[2] - 882 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     275 c[1] + 1165 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] < 0 &&
     195 c[1] + 1181 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     115 c[1] + 1197 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     35 c[1] + 1213 c[2] - 874 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     475 c[1] + 1085 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     395 c[1] + 1101 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     315 c[1] + 1117 c[2] - 866 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     675 c[1] + 1005 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     595 c[1] + 1021 c[2] - 858 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 &&
     875 c[1] + 925 c[2] - 850 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0 && 1155 c[1] +
       829 c[2] - 842 c[3] + 226 c[4] - 25 c[5] + c[6] ≥ 0, Array[c, 6], Integers]]
```

```
{1196, 6783, 39 525, 0, 0, 26 302 558}
```

```
GCD[1196, 6783, 39 525, 0, 0, 26 302 558]
```

```
1
```

```
Reverse[warrant2]
```

```
{26 302 558, 0, 0, 39 525, 6783, 1196}
```

```
warrant2.g
```

```
-22 185
```

```
warrant2.Transpose[A]
```

```
{27 523, 1739, 14 587, 27 435, 2011, -11 197, 1651,
 14 499, 27 347, 1563, 14 411, 27 259, 14 323, 27 171, 27 083, 26 995}
```

```
feasibleinterlacingpolylist[chi]
```

$$\{(-7+x)(-5+x)(-3+x)(5-10x+x^2),\ (-5+x)(17-252x+126x^2-20x^3+x^4),$$
$$(-5+x)(33-252x+126x^2-20x^3+x^4),\ (-7+x)(-5+x)(-7+35x-13x^2+x^3),$$
$$(-7+x)(-3+x)(-17+55x-15x^2+x^3),\ (-5+x)^2(11+51x-15x^2+x^3),$$
$$(-5+x)(-39-244x+126x^2-20x^3+x^4),\ (-5+x)(-23-244x+126x^2-20x^3+x^4),$$
$$(-7+x)(-5+x)(1+35x-13x^2+x^3),\ (-5+x)^2(19+51x-15x^2+x^3),$$
$$(-5+x)(-79-236x+126x^2-20x^3+x^4),\ (-9+x)(-7+x)(-5+x)(-1-4x+x^2),$$
$$(-9+x)(-5+x)^2(-3-6x+x^2),\ (-7+x)(-5+x)(17+35x-13x^2+x^3),$$
$$(-7+x)(-5+x)^2(-5-8x+x^2),\ (-7+x)(-5+x)(33+35x-13x^2+x^3)\}$$

```
list = {(-7 + x) (-5 + x) (-3 + x) (5 - 10 x + x^2), (-5 + x) (17 - 252 x + 126 x^2 - 20 x^3 + x^4),
    (-5 + x) (33 - 252 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-5 + x) (-7 + 35 x - 13 x^2 + x^3),
    (-7 + x) (-3 + x) (-17 + 55 x - 15 x^2 + x^3), (-5 + x)^2 (11 + 51 x - 15 x^2 + x^3),
    (-5 + x) (-39 - 244 x + 126 x^2 - 20 x^3 + x^4), (-5 + x) (-23 - 244 x + 126 x^2 - 20 x^3 + x^4),
    (-7 + x) (-5 + x) (1 + 35 x - 13 x^2 + x^3), (-5 + x)^2 (19 + 51 x - 15 x^2 + x^3),
    (-5 + x) (-79 - 236 x + 126 x^2 - 20 x^3 + x^4), (-9 + x) (-7 + x) (-5 + x) (-1 - 4 x + x^2),
    (-9 + x) (-5 + x)^2 (-3 - 6 x + x^2), (-7 + x) (-5 + x) (17 + 35 x - 13 x^2 + x^3),
    (-7 + x) (-5 + x)^2 (-5 - 8 x + x^2), (-7 + x) (-5 + x) (33 + 35 x - 13 x^2 + x^3)};
```

```
warrantpoly = {(-7 + x) (-3 + x) (-17 + 55 x - 15 x^2 + x^3), (-5 + x)^2 (11 + 51 x - 15 x^2 + x^3)}
```

$$\{(-7+x)(-3+x)(-17+55x-15x^2+x^3),\ (-5+x)^2(11+51x-15x^2+x^3)\}$$

```
anglesquared = anglesquaredmat[chi, list] // FullSimplify;
```

```
anglesquared // MatrixForm
```

$$\begin{pmatrix}
\frac{10}{19} & 0 & 0 & \frac{9}{38}+\frac{35}{38\sqrt{17}} & 0 & \frac{9}{38}-\frac{35}{38\sqrt{17}} \\
\frac{59}{114} & \frac{1}{8} & 0 & \frac{493+117\sqrt{17}}{5168} & \frac{1}{6} & \frac{493-117\sqrt{17}}{5168} \\
\frac{473}{912} & \frac{3}{32} & 0 & \frac{3145+673\sqrt{17}}{20672} & \frac{1}{12} & \frac{3145-673\sqrt{17}}{20672} \\
\frac{79}{152} & \frac{1}{16} & 0 & \frac{2159+439\sqrt{17}}{10336} & 0 & \frac{2159-439\sqrt{17}}{10336} \\
\frac{99}{190} & 0 & \frac{2}{5} & \frac{3}{76}-\frac{1}{76\sqrt{17}} & 0 & \frac{51+\sqrt{17}}{1292} \\
\frac{155}{304} & \frac{7}{32} & 0 & \frac{221+21\sqrt{17}}{20672} & \frac{1}{4} & \frac{221-21\sqrt{17}}{20672} \\
\frac{233}{456} & \frac{3}{16} & 0 & \frac{697+113\sqrt{17}}{10336} & \frac{1}{6} & \frac{697-113\sqrt{17}}{10336} \\
\frac{467}{912} & \frac{5}{32} & 0 & \frac{2567+431\sqrt{17}}{20672} & \frac{1}{12} & \frac{2567-431\sqrt{17}}{20672} \\
\frac{39}{76} & \frac{1}{8} & 0 & \frac{935+159\sqrt{17}}{5168} & 0 & \frac{935-159\sqrt{17}}{5168} \\
\frac{115}{228} & \frac{1}{4} & 0 & \frac{3}{76}-\frac{1}{76\sqrt{17}} & \frac{1}{6} & \frac{51+\sqrt{17}}{1292} \\
\frac{461}{912} & \frac{7}{32} & 0 & \frac{9\left(221+21\sqrt{17}\right)}{20672} & \frac{1}{12} & -\frac{9\left(-221+21\sqrt{17}\right)}{20672} \\
\frac{77}{152} & \frac{3}{16} & 0 & \frac{93}{608}+\frac{197}{608\sqrt{17}} & 0 & \frac{93}{608}-\frac{197}{608\sqrt{17}} \\
\frac{455}{912} & \frac{9}{32} & 0 & \frac{1411-53\sqrt{17}}{20672} & \frac{1}{12} & \frac{1411+53\sqrt{17}}{20672} \\
\frac{1}{2} & \frac{1}{4} & 0 & \frac{1}{136}\left(17+\sqrt{17}\right) & 0 & \frac{1}{8}-\frac{1}{8\sqrt{17}} \\
\frac{75}{152} & \frac{5}{16} & 0 & \frac{59}{608}-\frac{45}{608\sqrt{17}} & 0 & \frac{59}{608}+\frac{45}{608\sqrt{17}} \\
\frac{37}{76} & \frac{3}{8} & 0 & \frac{357-83\sqrt{17}}{5168} & 0 & \frac{357+83\sqrt{17}}{5168}
\end{pmatrix}$$

```
refinedlist = {};

For[i = 1, i ≤ Length[list], i++,
 If[compatible[
    combinations[chi, (x + 5) (x - 5) (x - 3) (x - 7), warrantpoly[[1]], list[[i]], list,
      anglesquared] // FullSimplify] == 1, AppendTo[refinedlist, list[[i]]]
]

refinedlist
```

$$\left\{(-7+x)\,(-5+x)\,(-3+x)\left(5-10\,x+x^2\right),\right.$$
$$(-5+x)\left(17-252\,x+126\,x^2-20\,x^3+x^4\right),\ (-7+x)\,(-3+x)\left(-17+55\,x-15\,x^2+x^3\right),$$
$$(-5+x)^2\left(11+51\,x-15\,x^2+x^3\right),\ (-5+x)^2\left(19+51\,x-15\,x^2+x^3\right),$$
$$\left.(-5+x)\left(-79-236\,x+126\,x^2-20\,x^3+x^4\right),\ (-7+x)\,(-5+x)\left(33+35\,x-13\,x^2+x^3\right)\right\}$$

```
refinedlist = {(-7 + x) (-3 + x) (-17 + 55 x - 15 x^2 + x^3),
    (-5 + x)^2 (11 + 51 x - 15 x^2 + x^3), (-5 + x)^2 (19 + 51 x - 15 x^2 + x^3),
    (-5 + x) (-79 - 236 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-5 + x) (-3 + x) (5 - 10 x + x^2),
    (-5 + x) (17 - 252 x + 126 x^2 - 20 x^3 + x^4), (-7 + x) (-5 + x) (33 + 35 x - 13 x^2 + x^3)};

refinedA = CoefficientList[refinedlist, x];
```

```
refinedA // MatrixForm
```

$$\begin{pmatrix} -357 & 1325 & -882 & 226 & -25 & 1 \\ 275 & 1165 & -874 & 226 & -25 & 1 \\ 475 & 1085 & -866 & 226 & -25 & 1 \\ 395 & 1101 & -866 & 226 & -25 & 1 \\ -525 & 1405 & -890 & 226 & -25 & 1 \\ -85 & 1277 & -882 & 226 & -25 & 1 \\ 1155 & 829 & -842 & 226 & -25 & 1 \end{pmatrix}$$

```
Solve[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 &&
  n[6] ≥ 0 && n[7] ≥ 0 && Array[n, 7].refinedA == g, Array[n, 7], Integers]
```

```
{{n[1] → 20, n[2] → 7, n[3] → 1, n[4] → 1, n[5] → 0, n[6] → 0, n[7] → 0}}
```

```
uniquesoln =
 Flatten[Array[n, 7] /. Solve[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 &&
     n[6] ≥ 0 && n[7] ≥ 0 && Array[n, 7].refinedA == g, Array[n, 7], Integers]]
```

```
{20, 7, 1, 1, 0, 0, 0}
```

```
refinedanglesquared = anglesquaredmat[chi, refinedlist] // FullSimplify;
```

```
refinedanglesquared // MatrixForm
```

$$\begin{pmatrix} \frac{99}{190} & 0 & \frac{2}{5} & \frac{3}{76}-\frac{1}{76\sqrt{17}} & 0 & \frac{51+\sqrt{17}}{1292} \\ \frac{155}{304} & \frac{7}{32} & 0 & \frac{221+21\sqrt{17}}{20672} & \frac{1}{4} & \frac{221-21\sqrt{17}}{20672} \\ \frac{115}{228} & \frac{1}{4} & 0 & \frac{3}{76}-\frac{1}{76\sqrt{17}} & \frac{1}{6} & \frac{51+\sqrt{17}}{1292} \\ \frac{461}{912} & \frac{7}{32} & 0 & \frac{9\left(221+21\sqrt{17}\right)}{20672} & \frac{1}{12} & -\frac{9\left(-221+21\sqrt{17}\right)}{20672} \\ \frac{10}{19} & 0 & 0 & \frac{9}{38}+\frac{35}{38\sqrt{17}} & 0 & \frac{9}{38}-\frac{35}{38\sqrt{17}} \\ \frac{59}{114} & \frac{1}{8} & 0 & \frac{493+117\sqrt{17}}{5168} & \frac{1}{6} & \frac{493-117\sqrt{17}}{5168} \\ \frac{37}{76} & \frac{3}{8} & 0 & \frac{357-83\sqrt{17}}{5168} & 0 & \frac{357+83\sqrt{17}}{5168} \end{pmatrix}$$

```
beta = Sqrt[3/76 - 1/(76 Sqrt[17])];
```

```
beta * (Sqrt[17] + 1) / 8 - Sqrt[(221 + 21 Sqrt[17])/20672] // FullSimplify
```

```
0
```

```
betabar = Sqrt[(51 + Sqrt[17])/1292];
```

```
betabar * (Sqrt[17] - 1) / 8 - Sqrt[(221 - 21 Sqrt[17])/20672] // FullSimplify
```

```
0
```

```
u = {beta, beta, beta, beta, beta, beta, beta, beta,
    beta, beta, beta, beta, beta, beta, beta, beta, beta, beta, beta,
    beta, beta, beta * (Sqrt[17] + 1) / 8, beta * (Sqrt[17] + 1) / 8,
    beta * (Sqrt[17] + 1) / 8, beta * (Sqrt[17] + 1) / 8, beta * (Sqrt[17] + 1) / 8,
    beta * (Sqrt[17] + 1) / 8, beta * (Sqrt[17] + 1) / 8, 3 * beta * (Sqrt[17] + 1) / 8};

combinations[chi, (x + 5) (x - 5) (x - 3) (x - 7), refinedlist[[1]],
  refinedlist[[2]], refinedlist, refinedanglesquared] // FullSimplify
```

$$\left\{\frac{75}{\sqrt{17}}, -19\right\}$$

```
v = {betabar, betabar, betabar, betabar, betabar, betabar,
    betabar, betabar, betabar, betabar, betabar, betabar, betabar, betabar,
    betabar, betabar, betabar, betabar, betabar, betabar, betabar,
    betabar, -betabar * (Sqrt[17] - 1) / 8, -betabar * (Sqrt[17] - 1) / 8,
    -betabar * (Sqrt[17] - 1) / 8, -betabar * (Sqrt[17] - 1) / 8,
    -betabar * (Sqrt[17] - 1) / 8, -betabar * (Sqrt[17] - 1) / 8,
    -betabar * (Sqrt[17] - 1) / 8, -3 * betabar * (Sqrt[17] - 1) / 8};

Total[u * v] // FullSimplify
```

$$\sqrt{\frac{17}{38}}$$

```
v = {-betabar, -betabar, -betabar, -betabar, -betabar, -betabar,
    -betabar, -betabar, -betabar, -betabar, -betabar, -betabar, -betabar,
    -betabar, -betabar, -betabar, -betabar, -betabar, -betabar, -betabar,
    -betabar, betabar * (Sqrt[17] - 1) / 8, betabar * (Sqrt[17] - 1) / 8,
    betabar * (Sqrt[17] - 1) / 8, betabar * (Sqrt[17] - 1) / 8,
    betabar * (Sqrt[17] - 1) / 8, betabar * (Sqrt[17] - 1) / 8,
    betabar * (Sqrt[17] - 1) / 8, 3 * betabar * (Sqrt[17] - 1) / 8};

Total[u * v] // FullSimplify
```

$$-\sqrt{\frac{17}{38}}$$

In[•]:=
```
chisub = (-9 + x) (-5 + x)^9 (5 + x)^14 (31 - 12 x + x^2) (-1 - 4 x + x^2)
```

Out[•]=
$$(-9+x)\,(-5+x)^9\,(5+x)^{14}\left(31-12\,x+x^2\right)\left(-1-4\,x+x^2\right)$$

```
list = feasibleinterlacingpolylist[chisub]
```

$$\left\{(-5+x)\left(150-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\right.$$
$$-718+855\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left.-686+855\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\right.$$

$$-654+855x+909x^2-830x^3+224x^4-25x^5+x^6,$$
$$(-1+x)(1+x)\left(38-13x+x^2\right)\left(31-12x+x^2\right),$$
$$(-5+x)(1+x)\left(31-12x+x^2\right)\left(6-9x+x^2\right),$$
$$(1+x)\left(31-12x+x^2\right)\left(-34+51x-14x^2+x^3\right),$$
$$(-9+x)(-5+x)(1+x)\left(-22+37x-12x^2+x^3\right),$$
$$(-9+x)(-5+x)(1+x)\left(-18+37x-12x^2+x^3\right),$$
$$(-5+x)(1+x)\left(170-351x+145x^2-21x^3+x^4\right),$$
$$(-5+x)(1+x)\left(178-351x+145x^2-21x^3+x^4\right),$$
$$(-5+x)(1+x)\left(150-347x+145x^2-21x^3+x^4\right),$$
$$(1+x)\left(-974+1973x-1080x^2+250x^3-26x^4+x^5\right),$$
$$(1+x)\left(-1014+1981x-1080x^2+250x^3-26x^4+x^5\right),$$
$$-1042+859x+945x^2-834x^3+224x^4-25x^5+x^6,$$
$$-1010+859x+945x^2-834x^3+224x^4-25x^5+x^6,$$
$$\left(31-12x+x^2\right)\left(-22+13x+37x^2-13x^3+x^4\right),$$
$$(-5+x)\left(218-237x-198x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(114-157x-206x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(-6-7x+x^2\right)\left(-11+39x-13x^2+x^3\right),$$
$$-298+851x+873x^2-826x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(154-165x-206x^2+124x^3-20x^4+x^5\right),$$
$$-738+979x+865x^2-826x^3+224x^4-25x^5+x^6,$$
$$-706+979x+865x^2-826x^3+224x^4-25x^5+x^6,$$
$$-922+795x+953x^2-834x^3+224x^4-25x^5+x^6,$$
$$-890+795x+953x^2-834x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(3-8x+x^2\right)\left(30+25x-12x^2+x^3\right),$$
$$-418+915x+865x^2-826x^3+224x^4-25x^5+x^6,$$
$$-798+623x+1005x^2-838x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(194-173x-206x^2+124x^3-20x^4+x^5\right),$$
$$-938+1059x+857x^2-826x^3+224x^4-25x^5+x^6,$$
$$-906+1059x+857x^2-826x^3+224x^4-25x^5+x^6,$$
$$-958+983x+893x^2-830x^3+224x^4-25x^5+x^6,$$
$$-926+983x+893x^2-830x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(138-181x-206x^2+124x^3-20x^4+x^5\right),$$
$$-6446+4087x+333x^2-798x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1194-565x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-9+x)(-5+x)\left(-14+15x+25x^2-11x^3+x^4\right),$$
$$-598+871x+901x^2-830x^3+224x^4-25x^5+x^6,$$
$$\left(31-12x+x^2\right)\left(-26+17x+37x^2-13x^3+x^4\right),$$
$$-1050+827x+953x^2-834x^3+224x^4-25x^5+x^6,$$
$$-1018+827x+953x^2-834x^3+224x^4-25x^5+x^6,$$
$$-998+951x+901x^2-830x^3+224x^4-25x^5+x^6,$$
$$-966+951x+901x^2-830x^3+224x^4-25x^5+x^6,$$
$$-934+951x+901x^2-830x^3+224x^4-25x^5+x^6,$$
$$-974+919x+909x^2-830x^3+224x^4-25x^5+x^6,$$
$$-942+919x+909x^2-830x^3+224x^4-25x^5+x^6,$$
$$-818+1075x+849x^2-826x^3+224x^4-25x^5+x^6,$$

$$-858+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-826+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-726+575\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-794+763\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-762+763\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-722+715\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-23+43\,x-13\,x^2+x^3\right)\left(30+25\,x-12\,x^2+x^3\right),$$
$$(-5+x)\left(158-149\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-758+903\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-726+903\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-678+807\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-646+807\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-614+807\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(130-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-618+995\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(122-165\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-578+947\,x+865\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(94-189\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1246+799\,x+989\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-802+731\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-770+731\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(174-149\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-838+919\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-806+919\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-598+791\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-566+791\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-534+791\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-478+727\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-446+727\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(114-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(42-149\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-178+787\,x+881\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\left(-1-4\,x+x^2\right)\left(-6+33\,x-12\,x^2+x^3\right),\ \left(31-12\,x+x^2\right)\left(2-9\,x+x^2\right)\left(-1-4\,x+x^2\right),$$
$$(-9+x)\left(42-33\,x-122\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-426+355\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\left(-1-4\,x+x^2\right)\left(-2+33\,x-12\,x^2+x^3\right),$$
$$-130+243\,x+1073\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-98+243\,x+1073\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-178+259\,x+1073\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-226+275\,x+1073\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-306+291\,x+1073\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-14+5\,x+37\,x^2-13\,x^3+x^4\right),$$
$$-58+195\,x+1081\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-1-4\,x+x^2\right)\left(26-299\,x+141\,x^2-21\,x^3+x^4\right),$$
$$-106+211\,x+1081\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$

$$\left(31-12\,x+x^2\right)\left(-6+5\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-9+x)\left(102-65\,x-118\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-998+703\,x+997\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1046+719\,x+997\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-670+591\,x+1005\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-750+607\,x+1005\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-718+607\,x+1005\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-926+655\,x+1005\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-1+x)\left(31-12\,x+x^2\right)\left(34+25\,x-12\,x^2+x^3\right),$$
$$(-9+x)\left(2-5\,x+x^2\right)\left(19+23\,x-11\,x^2+x^3\right),$$
$$-422+495\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-390+495\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-502+511\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-470+511\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-550+527\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-518+527\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-23+43\,x-13\,x^2+x^3\right)\left(26+25\,x-12\,x^2+x^3\right),$$
$$-678+559\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-26+9\,x+37\,x^2-13\,x^3+x^4\right),\ (-9+x)\left(-1-4\,x+x^2\right)\left(2+33\,x-12\,x^2+x^3\right),$$
$$(-9+x)\left(14-41\,x-118\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-94+383\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-62+383\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-174+399\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-142+399\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-254+415\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-222+415\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-190+415\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-302+431\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-270+431\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-350+447\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-430+463\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-398+463\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-478+479\,x+1021\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-18+9\,x+37\,x^2-13\,x^3+x^4\right),$$
$$-6+319\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-54+335\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-22+335\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-1-4\,x+x^2\right)\left(-10-295\,x+141\,x^2-21\,x^3+x^4\right),$$
$$\left(17+35\,x-13\,x^2+x^3\right)\left(-6+33\,x-12\,x^2+x^3\right),$$
$$-70+351\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-182+367\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-150+367\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-230+383\,x+1029\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-11+39\,x-13\,x^2+x^3\right)\left(18+29\,x-12\,x^2+x^3\right),$$
$$\left(31-12\,x+x^2\right)\left(-5-8\,x+x^2\right)\left(2-5\,x+x^2\right),\ \left(31-12\,x+x^2\right)\left(-2+9\,x+37\,x^2-13\,x^3+x^4\right),$$
$$-1866+1163\,x+921\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$

$$-1538+1051\,x+929\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1618+1067\,x+929\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-1+x)\,\left(-138-49\,x+65\,x^2-15\,x^3+x^4\right),$$
$$-1210+939\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1290+955\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1370+971\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1338+971\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1418+987\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1546+1019\,x+937\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,\left(98-81\,x-114\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-994+843\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-962+843\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1122+875\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1090+875\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1170+891\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-1+x)\,\left(1218+311\,x-634\,x^2+200\,x^3-24\,x^4+x^5\right),$$
$$-1298+923\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1346+939\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-46+13\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-9+x)\,\left(74-73\,x-114\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-634+731\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-746+747\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-714+747\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-682+747\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-874+779\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-842+779\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-970+811\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1098+843\,x+953\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,\left(34-65\,x-114\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-418+635\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-386+635\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(3-8\,x+x^2\right)\,\left(-118-103\,x+85\,x^2-17\,x^3+x^4\right),$$
$$-498+651\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-466+651\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-434+651\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-546+667\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-514+667\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-482+667\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-626+683\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-594+683\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-562+683\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-674+699\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-642+699\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-850+747\,x+961\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-30+13\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-9+x)\,\left(-1-4\,x+x^2\right)\,\left(6+33\,x-12\,x^2+x^3\right),$$

$$
\begin{aligned}
&(-9+x)\,(-5+x)\,\left(-2+11\,x+25\,x^2-11\,x^3+x^4\right),\\
&-58+523\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-26+523\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(34-101\,x-214\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-138+539\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-106+539\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(50-101\,x-214\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-218+555\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-186+555\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-154+555\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-298+571\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-14+47\,x-14\,x^2+x^3\right)\,\left(19+23\,x-11\,x^2+x^3\right),\\
&-234+571\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-378+587\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-346+587\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-314+587\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-426+603\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-394+603\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-362+603\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-474+619\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-442+619\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-554+635\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-522+635\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-490+635\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-602+651\,x+969\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(38-13\,x+x^2\right)\,\left(-15+12\,x+30\,x^2-12\,x^3+x^4\right),\\
&(-5+x)\,\left(-6-93\,x-214\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(10-93\,x-214\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-18+475\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&14+475\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-1-4\,x+x^2\right)\,\left(-46-291\,x+141\,x^2-21\,x^3+x^4\right),\\
&(-5+x)\,\left(26-93\,x-214\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-98+491\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-66+491\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(17+35\,x-13\,x^2+x^3\right)\,\left(-2+33\,x-12\,x^2+x^3\right),\\
&-178+507\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-146+507\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-114+507\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-226+523\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-194+523\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-162+523\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-306+539\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-274+539\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-11+39\,x-13\,x^2+x^3\right)\,\left(22+29\,x-12\,x^2+x^3\right),\\
&-354+555\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,\\
&-322+555\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$\left(31 - 12\,x + x^2\right)\,\left(-14 + 13\,x + 37\,x^2 - 13\,x^3 + x^4\right),$$
$$22 + 427\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-58 + 443\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-26 + 443\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$6 + 443\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,\ \left(38 - 13\,x + x^2\right)\,\left(-1 - 8\,x + x^2\right)\,\left(-1 - 4\,x + x^2\right),$$
$$-106 + 459\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-74 + 459\,x + 985\,x^2 - 834\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$\left(31 - 12\,x + x^2\right)\,\left(-6 + 13\,x + 37\,x^2 - 13\,x^3 + x^4\right),$$
$$(-9 + x)\,\left(262 - 137\,x - 110\,x^2 + 80\,x^3 - 16\,x^4 + x^5\right),$$
$$-2110 + 1399\,x + 861\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-2238 + 1431\,x + 861\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$(-9 + x)\,\left(198 - 121\,x - 110\,x^2 + 80\,x^3 - 16\,x^4 + x^5\right),$$
$$-1862 + 1303\,x + 869\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1830 + 1303\,x + 869\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$\left(10 - 9\,x + x^2\right)\,\left(-191 - 40\,x + 70\,x^2 - 16\,x^3 + x^4\right),$$
$$-1990 + 1335\,x + 869\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-2038 + 1351\,x + 869\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1534 + 1191\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1502 + 1191\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1614 + 1207\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1582 + 1207\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1662 + 1223\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1742 + 1239\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1710 + 1239\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1790 + 1255\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1838 + 1271\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1918 + 1287\,x + 877\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$\left(31 - 12\,x + x^2\right)\,\left(-66 + 17\,x + 37\,x^2 - 13\,x^3 + x^4\right),$$
$$(-9 + x)\,\left(134 - 105\,x - 110\,x^2 + 80\,x^3 - 16\,x^4 + x^5\right),$$
$$-1174 + 1079\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1286 + 1095\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1254 + 1095\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$(-1 + x)\,\left(1366 + 255\,x - 630\,x^2 + 200\,x^3 - 24\,x^4 + x^5\right),$$
$$-1334 + 1111\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1302 + 1111\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1414 + 1127\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$(-1 + x)\,\left(1382 + 255\,x - 630\,x^2 + 200\,x^3 - 24\,x^4 + x^5\right),$$
$$-1494 + 1143\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1462 + 1143\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1542 + 1159\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1510 + 1159\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1590 + 1175\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1670 + 1191\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$-1718 + 1207\,x + 885\,x^2 - 830\,x^3 + 224\,x^4 - 25\,x^5 + x^6,$$
$$\left(31 - 12\,x + x^2\right)\,\left(-58 + 17\,x + 37\,x^2 - 13\,x^3 + x^4\right),$$
$$(-9 + x)\,\left(94 - 97\,x - 110\,x^2 + 80\,x^3 - 16\,x^4 + x^5\right),$$

$$
\begin{aligned}
&-1038+999\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1006+999\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1118+1015\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1086+1015\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1054+1015\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1166+1031\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1134+1031\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1246+1047\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1214+1047\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1182+1047\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1294+1063\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1262+1063\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(1342+263\,x-630\,x^2+200\,x^3-24\,x^4+x^5\right),\\
&-1310+1079\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1422+1095\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1390+1095\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1470+1111\,x+893\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-50+17\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(142-149\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-678+887\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-646+887\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-918+935\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-886+935\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-854+935\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1046+967\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-982+967\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1094+983\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1062+983\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1174+999\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1142+999\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1222+1015\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1190+1015\,x+901\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(31-12\,x+x^2\right)\left(42+25\,x-12\,x^2+x^3\right),\\
&(-9+x)(-5+x)\left(-6+15\,x+25\,x^2-11\,x^3+x^4\right),\\
&(-5+x)\left(70-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-318+775\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(86-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-398+791\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(102-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-478+807\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-446+807\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(118-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-558+823\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&-526+823\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(134-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-638+839\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$-606+839\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-798+871\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-766+871\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-734+871\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-846+887\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-814+887\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-926+903\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-894+903\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-862+903\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-5+x)\,\left(-2-7\,x+x^2\right)\,\left(-1-4\,x+x^2\right),$$
$$(-5+x)\,\left(-2-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(14-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(30-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-118+695\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(46-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-198+711\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(62-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-278+727\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(3-8\,x+x^2\right)\,\left(26+25\,x-12\,x^2+x^3\right),$$
$$-358+743\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-326+743\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(94-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-438+759\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-406+759\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(110-133\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-518+775\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-486+775\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(2-5\,x+x^2\right)\,\left(-227-180\,x+122\,x^2-20\,x^3+x^4\right),$$
$$-726+823\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-694+823\,x+917\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(-10-125\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$\left(-1-4\,x+x^2\right)\,\left(-82-287\,x+141\,x^2-21\,x^3+x^4\right),$$
$$(-5+x)\,\left(6-125\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$2+631\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(22-125\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-78+647\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(2-9\,x+x^2\right)\,\left(19+23\,x-11\,x^2+x^3\right),$$
$$-158+663\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-126+663\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(54-125\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-238+679\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-206+679\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(70-125\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-318+695\,x+925\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-11+39\,x-13\,x^2+x^3\right)\,\left(26+29\,x-12\,x^2+x^3\right),$$

$$
\begin{aligned}
&(-5+x)\left(86-125x-210x^2+124x^3-20x^4+x^5\right),\\
&-398+711x+925x^2-830x^3+224x^4-25x^5+x^6,\\
&-366+711x+925x^2-830x^3+224x^4-25x^5+x^6,\\
&-334+711x+925x^2-830x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-18+17x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(-2-117x-210x^2+124x^3-20x^4+x^5\right),\\
&42+583x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&\left(-1-4x+x^2\right)\left(-74-287x+141x^2-21x^3+x^4\right),\\
&(-5+x)\left(14-117x-210x^2+124x^3-20x^4+x^5\right),\\
&-38+599x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&-6+599x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(-5-8x+x^2\right)\left(-6+33x-12x^2+x^3\right),\\
&-118+615x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&-86+615x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(46-117x-210x^2+124x^3-20x^4+x^5\right),\\
&-198+631x+933x^2-830x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(31-12x+x^2\right)\left(2-3x-8x^2+x^3\right),\ (-5+x)\left(-1-8x+x^2\right)\left(10+29x-12x^2+x^3\right),\\
&-2650+1747x+793x^2-826x^3+224x^4-25x^5+x^6,\\
&-2730+1763x+793x^2-826x^3+224x^4-25x^5+x^6,\\
&-2858+1795x+793x^2-826x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(-6-3x+x^2\right)\left(-43+47x-13x^2+x^3\right),\\
&-2402+1651x+801x^2-826x^3+224x^4-25x^5+x^6,\\
&-2482+1667x+801x^2-826x^3+224x^4-25x^5+x^6,\\
&-2530+1683x+801x^2-826x^3+224x^4-25x^5+x^6,\\
&-2610+1699x+801x^2-826x^3+224x^4-25x^5+x^6,\\
&-2658+1715x+801x^2-826x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(234-145x-106x^2+80x^3-16x^4+x^5\right),\\
&-2074+1539x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2154+1555x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2234+1571x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2202+1571x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2282+1587x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2362+1603x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2330+1603x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2410+1619x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&-2538+1651x+809x^2-826x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-86+21x+37x^2-13x^3+x^4\right),\\
&(-9+x)\left(194-137x-106x^2+80x^3-16x^4+x^5\right),\\
&-1858+1443x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1826+1443x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1794+1443x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1906+1459x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1874+1459x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1986+1475x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-1954+1475x+817x^2-826x^3+224x^4-25x^5+x^6,\\
&-2034+1491x+817x^2-826x^3+224x^4-25x^5+x^6,
\end{aligned}
$$

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\begin{aligned}
&-2002+1491\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2114+1507\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2082+1507\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-46+51\,x-14\,x^2+x^3\right)\left(47+19\,x-11\,x^2+x^3\right),\\
&-2210+1539\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2290+1555\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2338+1571\,x+817\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(13-10\,x+x^2\right)\left(-6-3\,x+x^2\right),\\
&(-9+x)(-5+x)(-1+x)\left(34+15\,x-10\,x^2+x^3\right),\\
&-1498+1331\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1466+1331\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(322-205\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1578+1347\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(1546+199\,x-626\,x^2+200\,x^3-24\,x^4+x^5\right),\\
&-1658+1363\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1626+1363\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1738+1379\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1706+1379\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1674+1379\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1786+1395\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1754+1395\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1866+1411\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1834+1411\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1802+1411\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1914+1427\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1882+1427\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1962+1443\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2042+1459\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2010+1459\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(38-13\,x+x^2\right)\left(-55+20\,x+30\,x^2-12\,x^3+x^4\right),\\
&\left(31-12\,x+x^2\right)\left(-70+21\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-9+x)(-5+x)\left(-26+19\,x+25\,x^2-11\,x^3+x^4\right),\\
&-1138+1219\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(250-197\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1218+1235\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(266-197\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1298+1251\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1266+1251\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(282-197\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1378+1267\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1346+1267\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)(-1+x)\left(-298-101\,x+105\,x^2-19\,x^3+x^4\right),\\
&-1458+1283\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1426+1283\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1538+1299\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(1506+207\,x-626\,x^2+200\,x^3-24\,x^4+x^5\right),
\end{aligned}
$$

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\begin{aligned}
&-1474+1299\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1618+1315\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1586+1315\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1554+1315\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1666+1331\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1634+1331\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1714+1347\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1682+1347\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1794+1363\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1762+1363\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1842+1379\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1810+1379\,x+833\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-62+21\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(178-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(194-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-938+1139\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(210-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1018+1155\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(226-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1098+1171\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(242-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1178+1187\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1146+1187\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(258-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1258+1203\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1226+1203\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(274-189\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1338+1219\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1306+1219\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1274+1219\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1418+1235\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1386+1235\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1354+1235\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(1466+215\,x-626\,x^2+200\,x^3-24\,x^4+x^5\right),\\
&-1434+1251\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1546+1267\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1514+1267\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(38-13\,x+x^2\right)\left(39+19\,x-11\,x^2+x^3\right),\\
&-1594+1283\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1562+1283\,x+841\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-54+21\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(122-181\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(154-181\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(186-181\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-898+1091\,x+849\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

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\begin{aligned}
&(-5+x)\left(202-181x-206x^2+124x^3-20x^4+x^5\right),\\
&-978+1107x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-946+1107x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(218-181x-206x^2+124x^3-20x^4+x^5\right),\\
&-1058+1123x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1026+1123x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(234-181x-206x^2+124x^3-20x^4+x^5\right),\\
&-1138+1139x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1106+1139x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1218+1155x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1186+1155x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1154+1155x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1298+1171x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1266+1171x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1234+1171x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1346+1187x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&-1314+1187x+849x^2-826x^3+224x^4-25x^5+x^6,\\
&(-1+x)\left(31-12x+x^2\right)\left(46+25x-12x^2+x^3\right),\\
&(-5+x)\left(82-173x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(98-173x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(146-173x-206x^2+124x^3-20x^4+x^5\right),\\
&-698+1011x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(162-173x-206x^2+124x^3-20x^4+x^5\right),\\
&-778+1027x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(210-173x-206x^2+124x^3-20x^4+x^5\right),\\
&-1018+1075x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&-986+1075x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&-954+1075x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&-1098+1091x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&-1066+1091x+857x^2-826x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-38+21x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(58-165x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(74-165x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(106-165x-206x^2+124x^3-20x^4+x^5\right),\\
&-498+931x+865x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(138-165x-206x^2+124x^3-20x^4+x^5\right),\\
&-658+963x+865x^2-826x^3+224x^4-25x^5+x^6,\\
&-626+963x+865x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(170-165x-206x^2+124x^3-20x^4+x^5\right),\\
&-818+995x+865x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(18-157x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(34-157x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(50-157x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(82-157x-206x^2+124x^3-20x^4+x^5\right),\\
&-378+867x+873x^2-826x^3+224x^4-25x^5+x^6,
\end{aligned}
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\begin{aligned}
&(-5+x)\left(98-157x-206x^2+124x^3-20x^4+x^5\right),\\
&-458+883x+873x^2-826x^3+224x^4-25x^5+x^6,\\
&-426+883x+873x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(-1-4x+x^2\right)\left(22+61x-16x^2+x^3\right),\\
&(-5+x)\left(-6-149x-206x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(-5-8x+x^2\right)\left(-2+33x-12x^2+x^3\right),\\
&(-5+x)\left(26-149x-206x^2+124x^3-20x^4+x^5\right),\\
&-98+771x+881x^2-826x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(-1-8x+x^2\right)\left(14+29x-12x^2+x^3\right),\\
&(-9+x)\left(358-193x-102x^2+80x^3-16x^4+x^5\right),\\
&-3350+2127x+725x^2-822x^3+224x^4-25x^5+x^6,\\
&-3478+2159x+725x^2-822x^3+224x^4-25x^5+x^6,\\
&-2974+1999x+733x^2-822x^3+224x^4-25x^5+x^6,\\
&-3022+2015x+733x^2-822x^3+224x^4-25x^5+x^6,\\
&-3102+2031x+733x^2-822x^3+224x^4-25x^5+x^6,\\
&-3150+2047x+733x^2-822x^3+224x^4-25x^5+x^6,\\
&-3230+2063x+733x^2-822x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(294-177x-102x^2+80x^3-16x^4+x^5\right),\\
&-2614+1887x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2726+1903x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2694+1903x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2774+1919x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2854+1935x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2822+1935x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2902+1951x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-2982+1967x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-3030+1983x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&-3158+2015x+741x^2-822x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(254-169x-102x^2+80x^3-16x^4+x^5\right),\\
&(-9+x)(-5+x)\left(-54+23x+25x^2-11x^3+x^4\right),\\
&-2398+1791x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2366+1791x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2478+1807x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2446+1807x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2526+1823x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&\left(-43+47x-13x^2+x^3\right)\left(58+21x-12x^2+x^3\right),\\
&-2606+1839x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2574+1839x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2654+1855x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2622+1855x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2734+1871x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2702+1871x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2782+1887x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2830+1903x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&-2910+1919x+749x^2-822x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-98+25x+37x^2-13x^3+x^4\right),
\end{aligned}
$$

$$
\begin{aligned}
&(-9+x)\,(-5+x)\,\left(-46+23\,x+25\,x^2-11\,x^3+x^4\right),\\
&-2038+1679\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(430-253\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2118+1695\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(446-253\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2198+1711\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2166+1711\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2278+1727\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2246+1727\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2358+1743\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2326+1743\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2294+1743\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2406+1759\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2374+1759\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2486+1775\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2454+1775\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2534+1791\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2502+1791\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2582+1807\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2662+1823\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2630+1823\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2710+1839\,x+757\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-90+25\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-9+x)\,(-5+x)\,(-1+x)\,\left(38+15\,x-10\,x^2+x^3\right),\\
&(-5+x)\,\left(358-245\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1758+1583\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(374-245\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1838+1599\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(390-245\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1918+1615\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(406-245\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1998+1631\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1966+1631\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(422-245\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2078+1647\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2046+1647\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2158+1663\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2126+1663\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2238+1679\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2206+1679\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2174+1679\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2286+1695\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2254+1695\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2334+1711\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2302+1711\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2414+1727\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$-2382+1727\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2462+1743\,x+765\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-82+25\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(286-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(302-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(318-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-1+x)\left(-334-97\,x+105\,x^2-19\,x^3+x^4\right),$$
$$-1638+1519\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(350-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1718+1535\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(366-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1798+1551\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1766+1551\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(382-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1878+1567\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1846+1567\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(398-237\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1958+1583\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1926+1583\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2038+1599\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2006+1599\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-42+51\,x-14\,x^2+x^3\right)\left(47+19\,x-11\,x^2+x^3\right),$$
$$-2086+1615\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2054+1615\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2166+1631\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2134+1631\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2214+1647\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2182+1647\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-74+25\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(246-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(262-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(278-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(294-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1438+1439\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(310-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1518+1455\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)(-1+x)\left(-326-97\,x+105\,x^2-19\,x^3+x^4\right),$$
$$-1598+1471\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(342-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1678+1487\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-1+x)\left(1646+159\,x-622\,x^2+200\,x^3-24\,x^4+x^5\right),$$
$$(-5+x)\left(358-229\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1758+1503\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1726+1503\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1838+1519\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$

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\begin{aligned}
&-1806+1519\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1774+1519\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1918+1535\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1886+1535\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1854+1535\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1966+1551\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1934+1551\,x+781\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-66+25\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(222-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(238-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(254-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1238+1359\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(270-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1318+1375\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(286-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1398+1391\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(302-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1478+1407\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1446+1407\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)(-1+x)\left(-318-97\,x+105\,x^2-19\,x^3+x^4\right),\\
&-1558+1423\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1526+1423\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(334-221\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1638+1439\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-1+x)\left(1606+167\,x-622\,x^2+200\,x^3-24\,x^4+x^5\right),\\
&-1718+1455\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1686+1455\,x+789\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-58+25\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(182-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(198-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(214-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(230-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1118+1295\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(246-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1198+1311\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(262-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1278+1327\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&-1246+1327\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(278-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1358+1343\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-34+51\,x-14\,x^2+x^3\right)\left(39+19\,x-11\,x^2+x^3\right),\\
&(-5+x)\left(294-213\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-1438+1359\,x+797\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)(-1+x)\left(31-12\,x+x^2\right)\left(-10-7\,x+x^2\right),\\
&(-5+x)\left(158-205\,x-202\,x^2+124\,x^3-20\,x^4+x^5\right),
\end{aligned}
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\begin{aligned}
&(-5+x)\left(174-205x-202x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(190-205x-202x^2+124x^3-20x^4+x^5\right),\\
&-918+1215x+805x^2-822x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(206-205x-202x^2+124x^3-20x^4+x^5\right),\\
&-998+1231x+805x^2-822x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(222-205x-202x^2+124x^3-20x^4+x^5\right),\\
&-1078+1247x+805x^2-822x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(238-205x-202x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(118-197x-202x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(134-197x-202x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(166-197x-202x^2+124x^3-20x^4+x^5\right),\\
&-798+1151x+813x^2-822x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(78-189x-202x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(110-189x-202x^2+124x^3-20x^4+x^5\right),\\
&-3842+2459x+657x^2-818x^3+224x^4-25x^5+x^6,\\
&-3970+2491x+657x^2-818x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(394-217x-98x^2+80x^3-16x^4+x^5\right),\\
&-3514+2347x+665x^2-818x^3+224x^4-25x^5+x^6,\\
&-3594+2363x+665x^2-818x^3+224x^4-25x^5+x^6,\\
&-3642+2379x+665x^2-818x^3+224x^4-25x^5+x^6,\\
&-3722+2395x+665x^2-818x^3+224x^4-25x^5+x^6,\\
&-3850+2427x+665x^2-818x^3+224x^4-25x^5+x^6,\\
&(-9+x)\left(354-209x-98x^2+80x^3-16x^4+x^5\right),\\
&-3298+2251x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3266+2251x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3346+2267x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3314+2267x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3394+2283x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3474+2299x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3442+2299x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3522+2315x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&-3602+2331x+673x^2-818x^3+224x^4-25x^5+x^6,\\
&\left(-73+63x-15x^2+x^3\right)\left(50+11x-10x^2+x^3\right),\\
&(-9+x)(-5+x)\left(-66+27x+25x^2-11x^3+x^4\right),\\
&-2938+2139x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(610-309x-198x^2+124x^3-20x^4+x^5\right),\\
&-3018+2155x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-2986+2155x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3098+2171x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3066+2171x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3146+2187x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3114+2187x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3226+2203x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3194+2203x+681x^2-818x^3+224x^4-25x^5+x^6,\\
&-3274+2219x+681x^2-818x^3+224x^4-25x^5+x^6,
\end{aligned}
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\begin{aligned}
&-3354+2235\,x+681\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3322+2235\,x+681\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3402+2251\,x+681\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3450+2267\,x+681\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3530+2283\,x+681\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-2+x)\left(31-12\,x+x^2\right)\left(59+15\,x-11\,x^2+x^3\right),\\
&(-9+x)(-5+x)\left(-58+27\,x+25\,x^2-11\,x^3+x^4\right),\\
&-2578+2027\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(538-301\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2658+2043\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(554-301\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2738+2059\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(570-301\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2818+2075\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2786+2075\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2898+2091\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2866+2091\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2978+2107\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2946+2107\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3026+2123\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2994+2123\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3106+2139\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3074+2139\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3154+2155\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3122+2155\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3202+2171\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3282+2187\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3330+2203\,x+689\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-110+29\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-9+x)(-5+x)\left(-50+27\,x+25\,x^2-11\,x^3+x^4\right),\\
&(-5+x)\left(466-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(482-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(498-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2458+1963\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(514-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2538+1979\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(530-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2618+1995\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2586+1995\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(546-293\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2698+2011\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-43+47\,x-13\,x^2+x^3\right)\left(62+21\,x-12\,x^2+x^3\right),\\
&-2778+2027\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2746+2027\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2858+2043\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
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\begin{aligned}
&-2826+2043\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2794+2043\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2906+2059\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2874+2059\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2954+2075\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-3034+2091\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(38-13\,x+x^2\right)\left(-79+28\,x+30\,x^2-12\,x^3+x^4\right),\\
&-3082+2107\,x+697\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-102+29\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(426-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(442-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(458-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2258+1883\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(474-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2338+1899\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(490-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2418+1915\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(-11-6\,x+x^2\right)\left(-46+51\,x-14\,x^2+x^3\right),\\
&-2498+1931\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2466+1931\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(522-285\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2578+1947\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2546+1947\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2658+1963\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2626+1963\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2594+1963\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2706+1979\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2674+1979\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2786+1995\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-54+55\,x-14\,x^2+x^3\right)\left(51+15\,x-11\,x^2+x^3\right),\\
&\left(13-10\,x+x^2\right)\left(-218-13\,x+61\,x^2-15\,x^3+x^4\right),\\
&-2802+2011\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-94+29\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(386-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(402-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(418-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(434-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2138+1819\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(450-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2218+1835\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(466-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2298+1851\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&-2266+1851\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(482-277\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-2378+1867\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$-2346+1867\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2458+1883\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2426+1883\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2538+1899\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2506+1899\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2474+1899\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2586+1915\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2554+1915\,x+713\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-86+29\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(346-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-1+x)\left(-362-93\,x+105\,x^2-19\,x^3+x^4\right),$$
$$(-5+x)\left(378-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(394-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1938+1739\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(410-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2018+1755\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(426-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2098+1771\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(442-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2178+1787\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2146+1787\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(458-269\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2258+1803\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2226+1803\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2338+1819\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2306+1819\,x+721\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-78+29\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(322-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(338-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-1+x)\left(-354-93\,x+105\,x^2-19\,x^3+x^4\right),$$
$$-1738+1659\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(370-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1818+1675\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(386-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1898+1691\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(402-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1978+1707\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1946+1707\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(418-261\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2058+1723\,x+729\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(31-12\,x+x^2\right)\left(14-3\,x-8\,x^2+x^3\right),$$
$$(-5+x)\left(282-253\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(298-253\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(314-253\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(330-253\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$

$$-1618+1595\,x+737\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,(-1+x)\,\left(-346-93\,x+105\,x^2-19\,x^3+x^4\right),$$
$$-1698+1611\,x+737\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(362-253\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(242-245\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(258-245\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(274-245\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(290-245\,x-198\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-1418+1515\,x+745\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(6-9\,x+x^2\right)\,\left(39+19\,x-11\,x^2+x^3\right),$$
$$(-9+x)\,\left(-7-2\,x+x^2\right)\,\left(-74+59\,x-14\,x^2+x^3\right),$$
$$-4414+2807\,x+589\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4462+2823\,x+589\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,\left(454-249\,x-94\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-4166+2711\,x+597\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4134+2711\,x+597\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4214+2727\,x+597\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4342+2759\,x+597\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4470+2791\,x+597\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3838+2599\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3806+2599\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3918+2615\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3886+2615\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3966+2631\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3934+2631\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4014+2647\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4094+2663\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4142+2679\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4222+2695\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-5+x)\,\left(-78+31\,x+25\,x^2-11\,x^3+x^4\right),$$
$$-3478+2487\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(718-357\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3558+2503\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(734-357\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3638+2519\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3606+2519\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3718+2535\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3686+2535\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3766+2551\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3846+2567\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3814+2567\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3894+2583\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3974+2599\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-73+63\,x-15\,x^2+x^3\right)\,\left(54+11\,x-10\,x^2+x^3\right),$$
$$-4022+2615\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4150+2647\,x+613\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$

$$(-9+x)\,(-7+x)\,(-5+x)\,\left(10-3x-4x^2+x^3\right),$$
$$(-5+x)\,\left(646-349x-194x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\,\left(662-349x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3278+2407x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\,\left(678-349x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3358+2423x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\,\left(694-349x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3438+2439x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3406+2439x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3518+2455x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3486+2455x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3598+2471x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3566+2471x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3646+2487x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3614+2487x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3726+2503x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3694+2503x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3774+2519x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3822+2535x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3902+2551x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3950+2567x+621x^2-814x^3+224x^4-25x^5+x^6,$$
$$\left(31-12x+x^2\right)\,\left(-130+33x+37x^2-13x^3+x^4\right),$$
$$(-5+x)\,\left(590-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\,\left(606-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\,\left(622-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3078+2327x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\,\left(638-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3158+2343x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\,\left(654-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3238+2359x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\,\left(670-341x-194x^2+124x^3-20x^4+x^5\right),$$
$$-3318+2375x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3286+2375x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3398+2391x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3366+2391x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3478+2407x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3446+2407x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3414+2407x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3526+2423x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3494+2423x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3574+2439x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3654+2455x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3622+2455x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$-3702+2471x+629x^2-814x^3+224x^4-25x^5+x^6,$$
$$\left(31-12x+x^2\right)\,\left(-122+33x+37x^2-13x^3+x^4\right),$$

$$
\begin{aligned}
&(-5+x)\left(550-333x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(566-333x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(582-333x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(598-333x-194x^2+124x^3-20x^4+x^5\right),\\
&-2958+2263x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(614-333x-194x^2+124x^3-20x^4+x^5\right),\\
&-3038+2279x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(630-333x-194x^2+124x^3-20x^4+x^5\right),\\
&-3118+2295x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3086+2295x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(646-333x-194x^2+124x^3-20x^4+x^5\right),\\
&-3198+2311x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3166+2311x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3278+2327x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3246+2327x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3326+2343x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3294+2343x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3406+2359x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3374+2359x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&-3454+2375x+637x^2-814x^3+224x^4-25x^5+x^6,\\
&\left(-58+55x-14x^2+x^3\right)\left(59+15x-11x^2+x^3\right),\\
&\left(31-12x+x^2\right)\left(-114+33x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(510-325x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(526-325x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(542-325x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(558-325x-194x^2+124x^3-20x^4+x^5\right),\\
&-2758+2183x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(574-325x-194x^2+124x^3-20x^4+x^5\right),\\
&\left(-43+47x-13x^2+x^3\right)\left(66+21x-12x^2+x^3\right),\\
&(-5+x)\left(590-325x-194x^2+124x^3-20x^4+x^5\right),\\
&-2918+2215x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(606-325x-194x^2+124x^3-20x^4+x^5\right),\\
&-2998+2231x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-2966+2231x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-3078+2247x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-3046+2247x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-3158+2263x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-3126+2263x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&\left(13-10x+x^2\right)\left(-238-9x+61x^2-15x^3+x^4\right),\\
&-3206+2279x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&-3174+2279x+645x^2-814x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-106+33x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(486-317x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(502-317x-194x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(518-317x-194x^2+124x^3-20x^4+x^5\right),
\end{aligned}
$$

$$-2558+2103\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(534-317\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2638+2119\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(550-317\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2718+2135\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(566-317\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2798+2151\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2766+2151\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(582-317\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2878+2167\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2846+2167\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2958+2183\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2926+2183\,x+653\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-98+33\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\,\left(446-309\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(-11-6\,x+x^2\right)\,\left(-42+51\,x-14\,x^2+x^3\right),$$
$$(-5+x)\,\left(478-309\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(494-309\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2438+2039\,x+661\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(10-9\,x+x^2\right)\,\left(51+15\,x-11\,x^2+x^3\right),$$
$$-2518+2055\,x+661\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(526-309\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2598+2071\,x+661\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2566+2071\,x+661\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(542-309\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2678+2087\,x+661\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(31-12\,x+x^2\right)\,\left(18-3\,x-8\,x^2+x^3\right),$$
$$(-5+x)\,\left(422-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(438-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(454-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2238+1959\,x+669\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(470-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2318+1975\,x+669\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(486-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,(-1+x)\,\left(-382-89\,x+105\,x^2-19\,x^3+x^4\right),$$
$$(-5+x)\,\left(398-293\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(414-293\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(342-285\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(358-285\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-5282+3267\,x+513\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4954+3155\,x+521\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5034+3171\,x+521\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,\left(514-281\,x-90\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-4706+3059\,x+529\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$

$$
\begin{aligned}
&-4786+3075\,x+529\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4754+3075\,x+529\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4834+3091\,x+529\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4962+3123\,x+529\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-9+x)\,(-7+x)\,(-5+x)\,(-2+x)\,\left(-7-2\,x+x^2\right),\\
&-4378+2947\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4458+2963\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4426+2963\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4538+2979\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4506+2979\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4586+2995\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4634+3011\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4714+3027\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4762+3043\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4842+3059\,x+537\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-9+x)\,(-5+x)\,\left(-90+35\,x+25\,x^2-11\,x^3+x^4\right),\\
&(-7+x)\,(-5+x)\,\left(-118+41\,x+33\,x^2-13\,x^3+x^4\right),\\
&-4098+2851\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(842-405\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4178+2867\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(858-405\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4258+2883\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4338+2899\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4306+2899\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4386+2915\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(-7-2\,x+x^2\right)\,\left(638-601\,x+185\,x^2-23\,x^3+x^4\right),\\
&-4434+2931\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4514+2947\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4594+2963\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4642+2979\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4770+3011\,x+545\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(754-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)\,(-5+x)\,\left(-110+41\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(786-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3898+2771\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(802-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3978+2787\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(818-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4058+2803\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4138+2819\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4106+2819\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4218+2835\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4186+2835\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4266+2851\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4346+2867\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-2+x)\,\left(2157-355\,x-454\,x^2+178\,x^3-23\,x^4+x^5\right),
\end{aligned}
$$

$$-4394+2883\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4442+2899\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(38-13\,x+x^2\right)\left(17-10\,x+x^2\right)\left(-7-2\,x+x^2\right),$$
$$\left(31-12\,x+x^2\right)\left(-150+37\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-7+x)(-5+x)\left(-102+41\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(730-389\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(746-389\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(762-389\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3778+2707\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(778-389\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3858+2723\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(794-389\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3938+2739\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3906+2739\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4018+2755\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3986+2755\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4098+2771\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4066+2771\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4146+2787\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4114+2787\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4194+2803\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4274+2819\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4322+2835\,x+561\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-142+37\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(674-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(690-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(706-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(722-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3578+2627\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(738-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3658+2643\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(754-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3738+2659\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(770-381\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3818+2675\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3786+2675\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3898+2691\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3866+2691\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3946+2707\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(38-13\,x+x^2\right)\left(-103+36\,x+30\,x^2-12\,x^3+x^4\right),$$
$$-4026+2723\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3994+2723\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4074+2739\,x+569\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-2+x)\left(31-12\,x+x^2\right)\left(67+15\,x-11\,x^2+x^3\right),$$
$$(-5+x)\left(650-373\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$

$$
\begin{aligned}
&(-5+x)\left(666-373x-190x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(682-373x-190x^2+124x^3-20x^4+x^5\right),\\
&-3378+2547x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(698-373x-190x^2+124x^3-20x^4+x^5\right),\\
&-3458+2563x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(714-373x-190x^2+124x^3-20x^4+x^5\right),\\
&-3538+2579x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(730-373x-190x^2+124x^3-20x^4+x^5\right),\\
&-3618+2595x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3586+2595x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3698+2611x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3666+2611x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3778+2627x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3746+2627x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3826+2643x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&-3794+2643x+577x^2-810x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-126+37x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(610-365x-190x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(626-365x-190x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(642-365x-190x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(658-365x-190x^2+124x^3-20x^4+x^5\right),\\
&-3258+2483x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(674-365x-190x^2+124x^3-20x^4+x^5\right),\\
&-3338+2499x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(690-365x-190x^2+124x^3-20x^4+x^5\right),\\
&-3418+2515x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&-3386+2515x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(706-365x-190x^2+124x^3-20x^4+x^5\right),\\
&-3498+2531x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&-3466+2531x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&-3578+2547x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&-3546+2547x+585x^2-810x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-118+37x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(586-357x-190x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(-14-7x+x^2\right)\left(-43+47x-13x^2+x^3\right),\\
&(-5+x)\left(618-357x-190x^2+124x^3-20x^4+x^5\right),\\
&-3058+2403x+593x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(634-357x-190x^2+124x^3-20x^4+x^5\right),\\
&-3138+2419x+593x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(13-10x+x^2\right)\left(50+11x-10x^2+x^3\right),\\
&-3218+2435x+593x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(666-357x-190x^2+124x^3-20x^4+x^5\right),\\
&-3298+2451x+593x^2-810x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(31-12x+x^2\right)\left(22-3x-8x^2+x^3\right),\\
&(-5+x)\left(546-349x-190x^2+124x^3-20x^4+x^5\right),
\end{aligned}
$$

$$(-5+x)\left(562-349\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(578-349\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(594-349\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-2938+2339\,x+601\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(610-349\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(506-341\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(522-341\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(538-341\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(482-333\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-9+x)\left(614-321\,x-86\,x^2+80\,x^3-16\,x^4+x^5\right),$$
$$-5654+3535\,x+453\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-7+x)\left(754-379\,x-120\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$-5246+3407\,x+461\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5326+3423\,x+461\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5406+3439\,x+461\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5454+3455\,x+461\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)(-5+x)\left(-110+39\,x+25\,x^2-11\,x^3+x^4\right),$$
$$-4918+3295\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(1006-461\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\left(714-371\,x-120\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$-5078+3327\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5158+3343\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5126+3343\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5206+3359\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-74+59\,x-14\,x^2+x^3\right)\left(71+11\,x-11\,x^2+x^3\right),$$
$$-5334+3391\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5462+3423\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)(-5+x)\left(-102+39\,x+25\,x^2-11\,x^3+x^4\right),$$
$$(-5+x)\left(934-453\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(950-453\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\left(674-363\,x-120\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-138+45\,x+33\,x^2-13\,x^3+x^4\right),$$
$$-4798+3231\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(982-453\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4878+3247\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4958+3263\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4926+3263\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5006+3279\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5086+3295\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5134+3311\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5214+3327\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5262+3343\,x+477\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(878-445\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(894-445\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),$$

$$
\begin{aligned}
&(-7+x)\,(-5+x)\,\left(-130+45\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(926-445\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4598+3151\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(942-445\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4678+3167\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4758+3183\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4726+3183\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4838+3199\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4806+3199\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4886+3215\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4966+3231\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4934+3231\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5014+3247\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5142+3279\,x+485\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-170+41\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-7+x)\,(-5+x)\,\left(-122+45\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(870-437\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(886-437\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4398+3071\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(902-437\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4478+3087\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(918-437\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4558+3103\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4638+3119\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4606+3119\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4718+3135\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4686+3135\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4766+3151\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4734+3151\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4814+3167\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4894+3183\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4942+3199\,x+493\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-162+41\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(814-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(830-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(846-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(862-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4278+3007\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(878-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4358+3023\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(894-429\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4438+3039\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4406+3039\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4518+3055\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4486+3055\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$
\begin{aligned}
&-4566+3071\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4646+3087\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4614+3087\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4694+3103\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-154+41\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(774-421\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(790-421\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(806-421\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(822-421\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4078+2927\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(838-421\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4158+2943\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(-7-2\,x+x^2\right)\left(-122+95\,x-18\,x^2+x^3\right),\\
&-4238+2959\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4318+2975\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4286+2975\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4398+2991\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4366+2991\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4446+3007\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4414+3007\,x+509\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-146+41\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(750-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(766-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(782-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3878+2847\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(798-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3958+2863\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(814-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4038+2879\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(830-413\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-4118+2895\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4086+2895\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4198+2911\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&-4166+2911\,x+517\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-138+41\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(710-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(726-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(742-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(758-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3758+2783\,x+525\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(774-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3838+2799\,x+525\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(790-405\,x-186\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-3918+2815\,x+525\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(31-12\,x+x^2\right)\left(26-3\,x-8\,x^2+x^3\right),
\end{aligned}
$$

$$(-5+x)\left(670-397x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(686-397x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(13-10x+x^2\right)\left(54+11x-10x^2+x^3\right),$$
$$(-5+x)\left(718-397x-186x^2+124x^3-20x^4+x^5\right),$$
$$-3558+2703x+533x^2-806x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(734-397x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(646-389x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(662-389x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(606-381x-186x^2+124x^3-20x^4+x^5\right),$$
$$(-9+x)\left(674-353x-82x^2+80x^3-16x^4+x^5\right),$$
$$(-7+x)\left(878-427x-116x^2+98x^3-18x^4+x^5\right),$$
$$-6274+3899x+385x^2-802x^3+224x^4-25x^5+x^6,$$
$$(-9+x)(-5+x)\left(-130+43x+25x^2-11x^3+x^4\right),$$
$$-5818+3755x+393x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5898+3771x+393x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5946+3787x+393x^2-802x^3+224x^4-25x^5+x^6,$$
$$-6026+3803x+393x^2-802x^3+224x^4-25x^5+x^6,$$
$$-6074+3819x+393x^2-802x^3+224x^4-25x^5+x^6,$$
$$(-9+x)(-5+x)\left(-122+43x+25x^2-11x^3+x^4\right),$$
$$(-5+x)\left(1114-509x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1130-509x-182x^2+124x^3-20x^4+x^5\right),$$
$$-5618+3675x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$(-7+x)\left(814-411x-116x^2+98x^3-18x^4+x^5\right),$$
$$-5778+3707x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5746+3707x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5826+3723x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5954+3755x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$-6082+3787x+401x^2-802x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1042-501x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1058-501x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1074-501x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1090-501x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)\left(774-403x-116x^2+98x^3-18x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-158+49x+33x^2-13x^3+x^4\right),$$
$$-5498+3611x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5578+3627x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5626+3643x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5706+3659x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5754+3675x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$-5834+3691x+409x^2-802x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1018-493x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1034-493x-182x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-150+49x+33x^2-13x^3+x^4\right),$$
$$-5218+3515x+417x^2-802x^3+224x^4-25x^5+x^6,$$

$$
\begin{aligned}
&(-5+x)\left(1066-493x-182x^2+124x^3-20x^4+x^5\right),\\
&-5298+3531x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5378+3547x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5458+3563x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5426+3563x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5506+3579x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5586+3595x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5634+3611x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&-5762+3643x+417x^2-802x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(978-485x-182x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)(-5+x)(-2+x)\left(71+11x-11x^2+x^3\right),\\
&(-5+x)\left(1010-485x-182x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1026-485x-182x^2+124x^3-20x^4+x^5\right),\\
&-5098+3451x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1042-485x-182x^2+124x^3-20x^4+x^5\right),\\
&-5178+3467x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&-5258+3483x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&-5226+3483x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&-5338+3499x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&-5306+3499x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&-5386+3515x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&\left(38-13x+x^2\right)\left(-143+44x+30x^2-12x^3+x^4\right),\\
&-5514+3547x+425x^2-802x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-182+45x+37x^2-13x^3+x^4\right),\\
&(-7+x)(-5+x)\left(-134+49x+33x^2-13x^3+x^4\right),\\
&(-5+x)\left(954-477x-182x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(970-477x-182x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(986-477x-182x^2+124x^3-20x^4+x^5\right),\\
&-4898+3371x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1002-477x-182x^2+124x^3-20x^4+x^5\right),\\
&-4978+3387x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1018-477x-182x^2+124x^3-20x^4+x^5\right),\\
&-5058+3403x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5138+3419x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5106+3419x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5186+3435x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5266+3451x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5234+3451x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&-5314+3467x+433x^2-802x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-174+45x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(914-469x-182x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(930-469x-182x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(946-469x-182x^2+124x^3-20x^4+x^5\right),\\
&-4698+3291x+441x^2-802x^3+224x^4-25x^5+x^6,\\
&(-5+x)(-2+x)\left(-481-6x+88x^2-18x^3+x^4\right),
\end{aligned}
$$

$$-4778+3307\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(978-469\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4858+3323\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4938+3339\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4906+3339\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5018+3355\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4986+3355\,x+441\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(17-10\,x+x^2\right)\,\left(-298+23\,x+57\,x^2-15\,x^3+x^4\right),$$
$$\left(31-12\,x+x^2\right)\,\left(-166+45\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\,\left(874-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(890-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(906-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(922-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4578+3227\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(938-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4658+3243\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(954-461\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4738+3259\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4706+3259\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4818+3275\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4786+3275\,x+449\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-158+45\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\,\left(850-453\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(866-453\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(882-453\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4378+3147\,x+457\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(898-453\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4458+3163\,x+457\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(914-453\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4538+3179\,x+457\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,(-2+x)\,\left(31-12\,x+x^2\right)\,\left(-15-6\,x+x^2\right),$$
$$(-5+x)\,\left(810-445\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(826-445\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(842-445\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(858-445\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(770-437\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(786-437\,x-182\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-9+x)\,(-3+x)\,\left(-258+45\,x+41\,x^2-13\,x^3+x^4\right),$$
$$-6718+4215\,x+317\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-6766+4231\,x+317\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-3+x)\,\left(2298-655\,x-324\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$(-9+x)\,(-5+x)\,\left(-142+47\,x+25\,x^2-11\,x^3+x^4\right),$$
$$(-5+x)\,\left(1294-565\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-6438+4119\,x+325\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,$$

$$
\begin{aligned}
&-6518+4135\,x+325\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-7+x)\left(938-459\,x-112\,x^2+98\,x^3-18\,x^4+x^5\right),\\
&-6646+4167\,x+325\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-9+x)(-5+x)\left(-134+47\,x+25\,x^2-11\,x^3+x^4\right),\\
&(-5+x)\left(1222-557\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1238-557\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1254-557\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6238+4039\,x+333\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6318+4055\,x+333\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-7+x)\left(914-451\,x-112\,x^2+98\,x^3-18\,x^4+x^5\right),\\
&-6574+4119\,x+333\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1182-549\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1198-549\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1214-549\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6038+3959\,x+341\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1230-549\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)\left(874-443\,x-112\,x^2+98\,x^3-18\,x^4+x^5\right),\\
&-6198+3991\,x+341\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6246+4007\,x+341\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6326+4023\,x+341\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6454+4055\,x+341\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1142-541\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1158-541\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1174-541\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)(-5+x)\left(-170+53\,x+33\,x^2-13\,x^3+x^4\right),\\
&-5918+3895\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5998+3911\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6078+3927\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6046+3927\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6126+3943\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6206+3959\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6254+3975\,x+349\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1118-533\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)(-5+x)\left(-162+53\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(1150-533\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5718+3815\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1166-533\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5798+3831\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5878+3847\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5958+3863\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5926+3863\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6006+3879\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6054+3895\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6134+3911\,x+357\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-202+49\,x+37\,x^2-13\,x^3+x^4\right),
\end{aligned}
$$

$$
\begin{aligned}
&(-7+x)\,(-5+x)\,\left(-154+53\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1094-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1110-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1126-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5598+3751\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1142-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5678+3767\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5758+3783\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5726+3783\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5806+3799\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5886+3815\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5934+3831\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-194+49\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1038-517\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1054-517\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1070-517\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1086-517\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5398+3671\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1102-517\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5478+3687\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5558+3703\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5638+3719\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5606+3719\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5686+3735\,x+373\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-186+49\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1014-509\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1030-509\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1046-509\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5198+3591\,x+381\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1062-509\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5278+3607\,x+381\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1078-509\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5358+3623\,x+381\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&-5438+3639\,x+381\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(17-10\,x+x^2\right)\,\left(-318+27\,x+57\,x^2-15\,x^3+x^4\right),\\
&\left(31-12\,x+x^2\right)\,\left(-178+49\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(974-501\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(990-501\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1006-501\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1022-501\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5078+3527\,x+389\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1038-501\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5158+3543\,x+389\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,(2+x)\,\left(31-12\,x+x^2\right)\,\left(17-10\,x+x^2\right),
\end{aligned}
$$

$$(-5+x)\left(934-493x-178x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(950-493x-178x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(966-493x-178x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(982-493x-178x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(910-485x-178x^2+124x^3-20x^4+x^5\right),$$
$$-7586+4675x+241x^2-794x^3+224x^4-25x^5+x^6,$$
$$-7258+4563x+249x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2446-711x-320x^2+158x^3-22x^4+x^5\right),$$
$$(-3+x)\left(2462-711x-320x^2+158x^3-22x^4+x^5\right),$$
$$(-9+x)(-5+x)\left(-154+51x+25x^2-11x^3+x^4\right),$$
$$(-5+x)\left(1402-613x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1418-613x-174x^2+124x^3-20x^4+x^5\right),$$
$$-7058+4483x+257x^2-794x^3+224x^4-25x^5+x^6,$$
$$-7138+4499x+257x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-7+x)(-3+x)\left(-346+51x+53x^2-15x^3+x^4\right),$$
$$(-5+x)\left(1346-605x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1362-605x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1378-605x-174x^2+124x^3-20x^4+x^5\right),$$
$$-6858+4403x+265x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6938+4419x+265x^2-794x^3+224x^4-25x^5+x^6,$$
$$-7018+4435x+265x^2-794x^3+224x^4-25x^5+x^6,$$
$$-7066+4451x+265x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1306-597x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1322-597x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1338-597x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1354-597x-174x^2+124x^3-20x^4+x^5\right),$$
$$-6738+4339x+273x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-7+x)\left(974-483x-108x^2+98x^3-18x^4+x^5\right),$$
$$-6866+4371x+273x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6946+4387x+273x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2358-687x-320x^2+158x^3-22x^4+x^5\right),$$
$$(-5+x)\left(1282-589x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1298-589x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1314-589x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)\left(934-475x-108x^2+98x^3-18x^4+x^5\right),$$
$$-6618+4275x+281x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6698+4291x+281x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6746+4307x+281x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6826+4323x+281x^2-794x^3+224x^4-25x^5+x^6,$$
$$-6874+4339x+281x^2-794x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1242-581x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1258-581x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-182+57x+33x^2-13x^3+x^4\right),$$
$$(-5+x)\left(1290-581x-174x^2+124x^3-20x^4+x^5\right),$$

$$
\begin{aligned}
&-6418+4195\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6498+4211\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6578+4227\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6546+4227\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6626+4243\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6754+4275\,x+289\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-3+x)\left(31-12\,x+x^2\right)\left(74+7\,x-10\,x^2+x^3\right),\\
&(-5+x)\left(1202-573\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)(-5+x)\left(-174+57\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(1234-573\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1250-573\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6218+4115\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1266-573\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6298+4131\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6378+4147\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6426+4163\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6506+4179\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6554+4195\,x+297\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-214+53\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(1178-565\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1210-565\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6018+4035\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1226-565\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-6098+4051\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6178+4067\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6258+4083\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6226+4083\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6306+4099\,x+305\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-206+53\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(1138-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1154-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1170-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1186-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5898+3971\,x+313\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1202-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5978+3987\,x+313\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6058+4003\,x+313\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&-6026+4003\,x+313\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\left(-198+53\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\left(1114-549\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1130-549\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\left(1146-549\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5698+3891\,x+321\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\left(1162-549\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-5778+3907\,x+321\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,
\end{aligned}
$$

$$(-5+x)\left(31-12x+x^2\right)\left(38-3x-8x^2+x^3\right),$$
$$(-5+x)(-2+x)\left(-537+2x+88x^2-18x^3+x^4\right),$$
$$(-5+x)\left(1090-541x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1106-541x-174x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1034-533x-174x^2+124x^3-20x^4+x^5\right),$$
$$-8206+5039x+173x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-9+x)(-5+x)(-3+x)\left(58+x-8x^2+x^3\right),$$
$$(-3+x)\left(2626-767x-316x^2+158x^3-22x^4+x^5\right),$$
$$-7958+4943x+181x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1510-661x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1526-661x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)(-3+x)\left(-514+49x+73x^2-17x^3+x^4\right),$$
$$(-3+x)\left(2586-759x-316x^2+158x^3-22x^4+x^5\right),$$
$$-7886+4895x+189x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-5+x)\left(1470-653x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1486-653x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1502-653x-170x^2+124x^3-20x^4+x^5\right),$$
$$-7558+4783x+197x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2546-751x-316x^2+158x^3-22x^4+x^5\right),$$
$$(-5+x)\left(1446-645x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1462-645x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1478-645x-170x^2+124x^3-20x^4+x^5\right),$$
$$-7358+4703x+205x^2-790x^3+224x^4-25x^5+x^6,$$
$$-7438+4719x+205x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2522-743x-316x^2+158x^3-22x^4+x^5\right),$$
$$(-5+x)\left(1406-637x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1422-637x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1438-637x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)\left(1034-515x-104x^2+98x^3-18x^4+x^5\right),$$
$$-7318+4655x+213x^2-790x^3+224x^4-25x^5+x^6,$$
$$-7366+4671x+213x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2482-735x-316x^2+158x^3-22x^4+x^5\right),$$
$$(-5+x)\left(1366-629x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1382-629x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(1398-629x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-202+61x+33x^2-13x^3+x^4\right),$$
$$-7038+4559x+221x^2-790x^3+224x^4-25x^5+x^6,$$
$$-7118+4575x+221x^2-790x^3+224x^4-25x^5+x^6,$$
$$-7198+4591x+221x^2-790x^3+224x^4-25x^5+x^6,$$
$$-7246+4607x+221x^2-790x^3+224x^4-25x^5+x^6,$$
$$(-3+x)\left(2458-727x-316x^2+158x^3-22x^4+x^5\right),$$
$$(-5+x)\left(1342-621x-170x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-194+61x+33x^2-13x^3+x^4\right),$$

$$
\begin{aligned}
&(-5+x)\left(1374-621x-170x^2+124x^3-20x^4+x^5\right),\\
&-6838+4479x+229x^2-790x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1390-621x-170x^2+124x^3-20x^4+x^5\right),\\
&-6918+4495x+229x^2-790x^3+224x^4-25x^5+x^6,\\
&-6998+4511x+229x^2-790x^3+224x^4-25x^5+x^6,\\
&-7046+4527x+229x^2-790x^3+224x^4-25x^5+x^6,\\
&-7126+4543x+229x^2-790x^3+224x^4-25x^5+x^6,\\
&(-3+x)\left(31-12x+x^2\right)\left(78+7x-10x^2+x^3\right),\\
&(-7+x)(-5+x)\left(-186+61x+33x^2-13x^3+x^4\right),\\
&(-5+x)\left(1318-613x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1334-613x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1350-613x-170x^2+124x^3-20x^4+x^5\right),\\
&-6718+4415x+237x^2-790x^3+224x^4-25x^5+x^6,\\
&-6798+4431x+237x^2-790x^3+224x^4-25x^5+x^6,\\
&-6878+4447x+237x^2-790x^3+224x^4-25x^5+x^6,\\
&-6846+4447x+237x^2-790x^3+224x^4-25x^5+x^6,\\
&-6926+4463x+237x^2-790x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-226+57x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(1278-605x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1294-605x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1310-605x-170x^2+124x^3-20x^4+x^5\right),\\
&-6518+4335x+245x^2-790x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1326-605x-170x^2+124x^3-20x^4+x^5\right),\\
&-6598+4351x+245x^2-790x^3+224x^4-25x^5+x^6,\\
&-6678+4367x+245x^2-790x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-218+57x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(1238-597x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1254-597x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1270-597x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1286-597x-170x^2+124x^3-20x^4+x^5\right),\\
&-6398+4271x+253x^2-790x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(31-12x+x^2\right)\left(42-3x-8x^2+x^3\right),\\
&(-5+x)\left(1198-589x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1214-589x-170x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1230-589x-170x^2+124x^3-20x^4+x^5\right),\\
&-8698+5371x+105x^2-786x^3+224x^4-25x^5+x^6,\\
&(-9+x)(-5+x)(-3+x)\left(62+x-8x^2+x^3\right),\\
&(-5+x)\left(1690-717x-166x^2+124x^3-20x^4+x^5\right),\\
&-8578+5307x+113x^2-786x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1634-709x-166x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)(-3+x)\left(-550+53x+73x^2-17x^3+x^4\right),\\
&(-5+x)\left(1666-709x-166x^2+124x^3-20x^4+x^5\right),\\
&-8378+5227x+121x^2-786x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1610-701x-166x^2+124x^3-20x^4+x^5\right),
\end{aligned}
$$

$$
\begin{aligned}
&(-5+x)\,(-3+x)\,\left(-542+53\,x+73\,x^2-17\,x^3+x^4\right),\\
&(-3+x)\,\left(2726-807\,x-312\,x^2+158\,x^3-22\,x^4+x^5\right),\\
&-8258+5163\,x+129\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1570-693\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1586-693\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,(-3+x)\,\left(-534+53\,x+73\,x^2-17\,x^3+x^4\right),\\
&(-3+x)\,\left(2686-799\,x-312\,x^2+158\,x^3-22\,x^4+x^5\right),\\
&-8186+5115\,x+137\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1546-685\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1562-685\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-7858+5003\,x+145\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-7+x)\,(-3+x)\,\left(-378+59\,x+53\,x^2-15\,x^3+x^4\right),\\
&-8066+5051\,x+145\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-5+x)\,\left(1506-677\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1522-677\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1538-677\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-7738+4939\,x+153\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-3+x)\,\left(2606-783\,x-312\,x^2+158\,x^3-22\,x^4+x^5\right),\\
&(-3+x)\,\left(38-13\,x+x^2\right)\,\left(69+3\,x-9\,x^2+x^3\right),\\
&(-5+x)\,\left(1466-669\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1482-669\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-7+x)\,(-5+x)\,\left(-214+65\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1514-669\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-7538+4859\,x+161\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&-7618+4875\,x+161\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-3+x)\,\left(2582-775\,x-312\,x^2+158\,x^3-22\,x^4+x^5\right),\\
&\left(31-12\,x+x^2\right)\,\left(-254+61\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-7+x)\,(-5+x)\,\left(-206+65\,x+33\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1458-661\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1474-661\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-7338+4779\,x+169\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&-7418+4795\,x+169\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&-7498+4811\,x+169\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&-7546+4827\,x+169\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&(-3+x)\,\left(31-12\,x+x^2\right)\,\left(82+7\,x-10\,x^2+x^3\right),\\
&(-5+x)\,\left(1402-653\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1418-653\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1434-653\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1450-653\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&-7218+4715\,x+177\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&-7298+4731\,x+177\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,\\
&\left(31-12\,x+x^2\right)\,\left(-238+61\,x+37\,x^2-13\,x^3+x^4\right),\\
&(-5+x)\,\left(1362-645\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),\\
&(-5+x)\,\left(1378-645\,x-166\,x^2+124\,x^3-20\,x^4+x^5\right),
\end{aligned}
$$

$$
\begin{aligned}
&(-5+x)\left(1394-645x-166x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1410-645x-166x^2+124x^3-20x^4+x^5\right),\\
&-7018+4635x+185x^2-786x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(31-12x+x^2\right)\left(46-3x-8x^2+x^3\right),\\
&(-5+x)\left(1338-637x-166x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1354-637x-166x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1798-765x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1814-765x-162x^2+124x^3-20x^4+x^5\right),\\
&-9198+5671x+45x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1774-757x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1790-757x-162x^2+124x^3-20x^4+x^5\right),\\
&\left(-11-2x+x^2\right)\left(818-657x+189x^2-23x^3+x^4\right),\\
&(-5+x)(-3+x)\left(-578+57x+73x^2-17x^3+x^4\right),\\
&(-5+x)\left(1750-749x-162x^2+124x^3-20x^4+x^5\right),\\
&-8878+5527x+61x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)(-3+x)\left(-570+57x+73x^2-17x^3+x^4\right),\\
&(-5+x)\left(1726-741x-162x^2+124x^3-20x^4+x^5\right),\\
&-8678+5447x+69x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1670-733x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)(-3+x)\left(-562+57x+73x^2-17x^3+x^4\right),\\
&-8558+5383x+77x^2-782x^3+224x^4-25x^5+x^6,\\
&-8686+5415x+77x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1630-725x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1646-725x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)(-3+x)\left(-554+57x+73x^2-17x^3+x^4\right),\\
&(-7+x)(-3+x)\left(-398+63x+53x^2-15x^3+x^4\right),\\
&-8438+5319x+85x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1606-717x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1622-717x-162x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)(-5+x)(-3+x)\left(78+3x-10x^2+x^3\right),\\
&-8158+5223x+93x^2-782x^3+224x^4-25x^5+x^6,\\
&(-3+x)\left(2746-831x-308x^2+158x^3-22x^4+x^5\right),\\
&-8366+5271x+93x^2-782x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1566-709x-162x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)(-5+x)\left(-226+69x+33x^2-13x^3+x^4\right),\\
&(-5+x)\left(1598-709x-162x^2+124x^3-20x^4+x^5\right),\\
&-8038+5159x+101x^2-782x^3+224x^4-25x^5+x^6,\\
&(-3+x)\left(2706-823x-308x^2+158x^3-22x^4+x^5\right),\\
&(-3+x)\left(2722-823x-308x^2+158x^3-22x^4+x^5\right),\\
&\left(31-12x+x^2\right)\left(-266+65x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(1542-701x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1558-701x-162x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1574-701x-162x^2+124x^3-20x^4+x^5\right),
\end{aligned}
$$

$$-7838+5079\,x+109\,x^2-782\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-7918+5095\,x+109\,x^2-782\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-3+x)\left(31-12\,x+x^2\right)\left(86+7\,x-10\,x^2+x^3\right),$$
$$(-5+x)\left(1502-693\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(22-11\,x+x^2\right)\left(69+3\,x-9\,x^2+x^3\right),$$
$$(-5+x)\left(1534-693\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(31-12\,x+x^2\right)\left(50-3\,x-8\,x^2+x^3\right),$$
$$(-5+x)\left(1462-685\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1478-685\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1938-813\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1898-805\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1914-805\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1874-797\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-9498+5891\,x-7\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(1834-789\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1850-789\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-3+x)\left(-598+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-5+x)\left(1810-781\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-9178+5747\,x+9\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)(-3+x)\left(-590+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-5+x)\left(1786-773\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-8978+5667\,x+17\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-7+x)\left(1294-627\,x-92\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$(-5+x)\left(1730-765\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-3+x)\left(-582+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-5+x)\left(1762-765\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-8858+5603\,x+25\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-8986+5635\,x+25\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(1706-757\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)(-5+x)(-3+x)\left(82+3\,x-10\,x^2+x^3\right),$$
$$(-3+x)\left(2886-879\,x-304\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$-8738+5539\,x+33\,x^2-778\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(26-11\,x+x^2\right)\left(-11-2\,x+x^2\right),$$
$$(-7+x)(-5+x)\left(-238+73\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(1682-749\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-3+x)\left(-566+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-3+x)\left(2846-871\,x-304\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$\left(31-12\,x+x^2\right)\left(-278+69\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(1626-741\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1642-741\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(1658-741\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)(-3+x)\left(31-12\,x+x^2\right)\left(-18-5\,x+x^2\right),$$
$$(-5+x)\left(1602-733\,x-158\,x^2+124\,x^3-20\,x^4+x^5\right),$$

$$
\begin{aligned}
&(-5+x)\left(2062-861x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2038-853x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1998-845x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1974-837x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1934-829x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1894-821x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1910-821x-154x^2+124x^3-20x^4+x^5\right),\\
&-9678+6047x-51x^2-774x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1870-813x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1886-813x-154x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)\left(1354-659x-88x^2+98x^3-18x^4+x^5\right),\\
&(-5+x)(-3+x)\left(-610+65x+73x^2-17x^3+x^4\right),\\
&(-5+x)\left(1846-805x-154x^2+124x^3-20x^4+x^5\right),\\
&-9358+5903x-35x^2-774x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-306+73x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(1790-797x-154x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)(-5+x)(-3+x)\left(86+3x-10x^2+x^3\right),\\
&(-5+x)\left(1822-797x-154x^2+124x^3-20x^4+x^5\right),\\
&-9158+5823x-27x^2-774x^3+224x^4-25x^5+x^6,\\
&\left(31-12x+x^2\right)\left(-298+73x+37x^2-13x^3+x^4\right),\\
&(-5+x)\left(1766-789x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)(-3+x)\left(-594+65x+73x^2-17x^3+x^4\right),\\
&(-5+x)\left(31-12x+x^2\right)\left(58-3x-8x^2+x^3\right),\\
&(-5+x)\left(1726-781x-154x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2162-901x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2098-885x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2058-877x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2034-869x-150x^2+124x^3-20x^4+x^5\right),\\
&\left(38-13x+x^2\right)\left(-271+76x+30x^2-12x^3+x^4\right),\\
&(-5+x)\left(1994-861x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2010-861x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(1970-853x-150x^2+124x^3-20x^4+x^5\right),\\
&-9978+6267x-103x^2-770x^3+224x^4-25x^5+x^6,\\
&(-5+x)\left(1930-845x-150x^2+124x^3-20x^4+x^5\right),\\
&(-7+x)(-5+x)\left(-278+81x+33x^2-13x^3+x^4\right),\\
&\left(31-12x+x^2\right)\left(-318+77x+37x^2-13x^3+x^4\right),\\
&(-7+x)(-5+x)(-3+x)\left(90+3x-10x^2+x^3\right),\\
&(-5+x)\left(1906-837x-150x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(31-12x+x^2\right)\left(62-3x-8x^2+x^3\right),\\
&(-5+x)\left(2158-917x-146x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2134-909x-146x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2094-901x-146x^2+124x^3-20x^4+x^5\right),\\
&(-5+x)\left(2054-893x-146x^2+124x^3-20x^4+x^5\right),
\end{aligned}
$$

$$(-5+x)\left(2070-893x-146x^2+124x^3-20x^4+x^5\right),$$
$$\left(31-12x+x^2\right)\left(-338+81x+37x^2-13x^3+x^4\right),$$
$$(-7+x)(-5+x)\left(-290+85x+33x^2-13x^3+x^4\right),$$
$$(-5+x)\left(31-12x+x^2\right)\left(66-3x-8x^2+x^3\right),$$
$$(-5+x)\left(2258-957x-142x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(2194-941x-142x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(2154-933x-142x^2+124x^3-20x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(31-12x+x^2\right)\left(-10-x+x^2\right),$$
$$(-5+x)\left(2318-989x-138x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)\left(31-12x+x^2\right)\left(74-3x-8x^2+x^3\right),\ (-5+x)\left(31-12x+x^2\right)\left(78-3x-8x^2+x^3\right)\}$$

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Length[list]
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1950

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listmod128 = modfilter[list * mu[chisub] // Factor, chiSmod128n27, 128]
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$$\{(-5+x)^9(5+x)^{13}\left(150-141x-210x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)^8(5+x)^{13}\left(-686+855x+909x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^9(1+x)(5+x)^{13}\left(178-351x+145x^2-21x^3+x^4\right),$$
$$(-5+x)^8(5+x)^{13}\left(-6446+4087x+333x^2-798x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-942+919x+909x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-826+1043x+857x^2-826x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^9(5+x)^{13}\left(114-173x-206x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)^8(5+x)^{13}\left(-554+387x+1065x^2-842x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-390+495x+1013x^2-838x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-550+527x+1013x^2-838x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(31-12x+x^2\right)\left(-26+9x+37x^2-13x^3+x^4\right),$$
$$(-5+x)^8(5+x)^{13}\left(-994+843x+945x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-1090+875x+945x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-1346+939x+945x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-98+491x+977x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(17+35x-13x^2+x^3\right)\left(-2+33x-12x^2+x^3\right),$$
$$(-5+x)^8(5+x)^{13}\left(-194+523x+977x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-354+555x+977x^2-834x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-1582+1207x+877x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-1742+1239x+877x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-1838+1271x+877x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-9+x)(-5+x)^9(5+x)^{13}\left(-6+15x+25x^2-11x^3+x^4\right),$$
$$(-5+x)^9(5+x)^{13}\left(86-141x-210x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)^9(5+x)^{13}\left(118-141x-210x^2+124x^3-20x^4+x^5\right),$$
$$(-5+x)^8(5+x)^{13}\left(-526+823x+909x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^8(5+x)^{13}\left(-846+887x+909x^2-830x^3+224x^4-25x^5+x^6\right),$$
$$(-5+x)^9(5+x)^{13}\left(-1-8x+x^2\right)\left(10+29x-12x^2+x^3\right),$$
$$(-9+x)(-5+x)^9(-1+x)(5+x)^{13}\left(34+15x-10x^2+x^3\right),$$

$$(-5+x)^8\,(5+x)^{13}\left(-1466+1331\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1626+1363\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1786+1395\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1882+1427\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2042+1459\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(82-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(146-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(210-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-986+1075\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(-1-8\,x+x^2\right)\left(14+29\,x-12\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2614+1887\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2774+1919\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3030+1983\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1718+1535\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1878+1567\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2038+1599\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-42+51\,x-14\,x^2+x^3\right)\left(47+19\,x-11\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2134+1631\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(31-12\,x+x^2\right)\left(-74+25\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-918+1215\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1078+1247\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3314+2267\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3474+2299\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2258+1883\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2418+1915\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2578+1947\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2674+1979\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(13-10\,x+x^2\right)\left(-218-13\,x+61\,x^2-15\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1618+1595\,x+737\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3806+2599\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3966+2631\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4222+2695\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
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$$(-5+x)^9\,(5+x)^{13}\left(582-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(614-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(646-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3166+2311\,x+637\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
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$$(-5+x)^8\,(5+x)^{13}\left(-58+55\,x-14\,x^2+x^3\right)\left(59+15\,x-11\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(422-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
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$$(-5+x)^9\,(5+x)^{13}\left(486-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$

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$$(-5+x)^8\ (5+x)^{13}\ \left(-4266+2851\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6\right),$$
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Length[listmod128]

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{-3558, 2703, 533, -806, 224, -25, 1}, {-5698, 3691, 401, -802, 224, -25, 1},
{-5954, 3755, 401, -802, 224, -25, 1}, {-4898, 3371, 433, -802, 224, -25, 1},
{-5058, 3403, 433, -802, 224, -25, 1}, {-5314, 3467, 433, -802, 224, -25, 1},
{-6030, 3991, 333, -798, 224, -25, 1}, {-6190, 4023, 333, -798, 224, -25, 1},
{-6446, 4087, 333, -798, 224, -25, 1}, {-5390, 3703, 365, -798, 224, -25, 1},
{-5550, 3735, 365, -798, 224, -25, 1}, {-5710, 3767, 365, -798, 224, -25, 1},
{-5806, 3799, 365, -798, 224, -25, 1}, {-4750, 3415, 397, -798, 224, -25, 1},
{-4910, 3447, 397, -798, 224, -25, 1}, {-7386, 4595, 249, -794, 224, -25, 1},
{-6490, 4243, 281, -794, 224, -25, 1}, {-6746, 4307, 281, -794, 224, -25, 1},
{-5690, 3923, 313, -794, 224, -25, 1}, {-5850, 3955, 313, -794, 224, -25, 1},
{-6010, 3987, 313, -794, 224, -25, 1}, {-7638, 4799, 197, -790, 224, -25, 1},
{-6838, 4479, 229, -790, 224, -25, 1}, {-6998, 4511, 229, -790, 224, -25, 1},
{-7254, 4575, 229, -790, 224, -25, 1}, {-8178, 5147, 129, -786, 224, -25, 1},
{-7538, 4859, 161, -786, 224, -25, 1}, {-8670, 5479, 61, -782, 224, -25, 1},
{-8030, 5191, 93, -782, 224, -25, 1}, {-8190, 5223, 93, -782, 224, -25, 1},
{-7390, 4903, 125, -782, 224, -25, 1}, {-8970, 5699, 9, -778, 224, -25, 1},

```
{-8330, 5411, 41, -778, 224, -25, 1}, {-8490, 5443, 41, -778, 224, -25, 1},
{-9478, 5967, -43, -774, 224, -25, 1}, {-10670, 6679, -179, -766, 224, -25, 1},
{-10970, 6899, -231, -762, 224, -25, 1}};
```

```
Asub // MatrixForm
```

$$\begin{pmatrix}
-554 & 387 & 1065 & -842 & 224 & -25 & 1 \\
-390 & 495 & 1013 & -838 & 224 & -25 & 1 \\
-550 & 527 & 1013 & -838 & 224 & -25 & 1 \\
-806 & 591 & 1013 & -838 & 224 & -25 & 1 \\
-994 & 843 & 945 & -834 & 224 & -25 & 1 \\
-1090 & 875 & 945 & -834 & 224 & -25 & 1 \\
-1346 & 939 & 945 & -834 & 224 & -25 & 1 \\
-98 & 491 & 977 & -834 & 224 & -25 & 1 \\
-34 & 491 & 977 & -834 & 224 & -25 & 1 \\
-194 & 523 & 977 & -834 & 224 & -25 & 1 \\
-354 & 555 & 977 & -834 & 224 & -25 & 1 \\
-1582 & 1207 & 877 & -830 & 224 & -25 & 1 \\
-1742 & 1239 & 877 & -830 & 224 & -25 & 1 \\
-1838 & 1271 & 877 & -830 & 224 & -25 & 1 \\
-270 & 759 & 909 & -830 & 224 & -25 & 1 \\
-430 & 791 & 909 & -830 & 224 & -25 & 1 \\
-590 & 823 & 909 & -830 & 224 & -25 & 1 \\
-526 & 823 & 909 & -830 & 224 & -25 & 1 \\
-750 & 855 & 909 & -830 & 224 & -25 & 1 \\
-686 & 855 & 909 & -830 & 224 & -25 & 1 \\
-846 & 887 & 909 & -830 & 224 & -25 & 1 \\
-942 & 919 & 909 & -830 & 224 & -25 & 1 \\
50 & 535 & 941 & -830 & 224 & -25 & 1 \\
-1530 & 1331 & 825 & -826 & 224 & -25 & 1 \\
-1466 & 1331 & 825 & -826 & 224 & -25 & 1 \\
-1626 & 1363 & 825 & -826 & 224 & -25 & 1 \\
-1786 & 1395 & 825 & -826 & 224 & -25 & 1 \\
-1882 & 1427 & 825 & -826 & 224 & -25 & 1 \\
-2042 & 1459 & 825 & -826 & 224 & -25 & 1 \\
-410 & 947 & 857 & -826 & 224 & -25 & 1 \\
-570 & 979 & 857 & -826 & 224 & -25 & 1 \\
-730 & 1011 & 857 & -826 & 224 & -25 & 1 \\
-890 & 1043 & 857 & -826 & 224 & -25 & 1 \\
-826 & 1043 & 857 & -826 & 224 & -25 & 1 \\
-1050 & 1075 & 857 & -826 & 224 & -25 & 1 \\
-986 & 1075 & 857 & -826 & 224 & -25 & 1 \\
70 & 691 & 889 & -826 & 224 & -25 & 1 \\
-2614 & 1887 & 741 & -822 & 224 & -25 & 1 \\
-2774 & 1919 & 741 & -822 & 224 & -25 & 1 \\
-3030 & 1983 & 741 & -822 & 224 & -25 & 1 \\
-1718 & 1535 & 773 & -822 & 224 & -25 & 1 \\
-1878 & 1567 & 773 & -822 & 224 & -25 & 1 \\
-2038 & 1599 & 773 & -822 & 224 & -25 & 1 \\
-1974 & 1599 & 773 & -822 & 224 & -25 & 1 \\
-2134 & 1631 & 773 & -822 & 224 & -25 & 1 \\
-2294 & 1663 & 773 & -822 & 224 & -25 & 1 \\
-918 & 1215 & 805 & -822 & 224 & -25 & 1 \\
-1078 & 1247 & 805 & -822 & 224 & -25 & 1 \\
-3314 & 2267 & 673 & -818 & 224 & -25 & 1 \\
-3474 & 2299 & 673 & -818 & 224 & -25 & 1
\end{pmatrix}$$

−3474	2299	673	−818	224	−25	1
−2258	1883	705	−818	224	−25	1
−2418	1915	705	−818	224	−25	1
−2578	1947	705	−818	224	−25	1
−2674	1979	705	−818	224	−25	1
−2834	2011	705	−818	224	−25	1
−1618	1595	737	−818	224	−25	1
−3806	2599	605	−814	224	−25	1
−3966	2631	605	−814	224	−25	1
−4222	2695	605	−814	224	−25	1
−2750	2215	637	−814	224	−25	1
−2910	2247	637	−814	224	−25	1
−3070	2279	637	−814	224	−25	1
−3230	2311	637	−814	224	−25	1
−3166	2311	637	−814	224	−25	1
−3326	2343	637	−814	224	−25	1
−3422	2375	637	−814	224	−25	1
−2110	1927	669	−814	224	−25	1
−2270	1959	669	−814	224	−25	1
−2430	1991	669	−814	224	−25	1
−3850	2755	553	−810	224	−25	1
−4010	2787	553	−810	224	−25	1
−4106	2819	553	−810	224	−25	1
−4266	2851	553	−810	224	−25	1
−4522	2915	553	−810	224	−25	1
−3050	2435	585	−810	224	−25	1
−3210	2467	585	−810	224	−25	1
−3370	2499	585	−810	224	−25	1
−3530	2531	585	−810	224	−25	1
−3466	2531	585	−810	224	−25	1
−2410	2147	617	−810	224	−25	1
−4998	3311	469	−806	224	−25	1
−5158	3343	469	−806	224	−25	1
−5254	3375	469	−806	224	−25	1
−4358	3023	501	−806	224	−25	1
−4518	3055	501	−806	224	−25	1
−4614	3087	501	−806	224	−25	1
−4774	3119	501	−806	224	−25	1
−3558	2703	533	−806	224	−25	1
−5698	3691	401	−802	224	−25	1
−5954	3755	401	−802	224	−25	1
−4898	3371	433	−802	224	−25	1
−5058	3403	433	−802	224	−25	1
−5314	3467	433	−802	224	−25	1
−6030	3991	333	−798	224	−25	1
−6190	4023	333	−798	224	−25	1
−6446	4087	333	−798	224	−25	1
−5390	3703	365	−798	224	−25	1
−5550	3735	365	−798	224	−25	1
−5710	3767	365	−798	224	−25	1
−5806	3799	365	−798	224	−25	1
−4750	3415	397	−798	224	−25	1
−4910	3447	397	−798	224	−25	1
−7386	4595	249	−794	224	−25	1
−6490	4243	281	−794	224	−25	1

$$\begin{pmatrix} -6746 & 4307 & 281 & -794 & 224 & -25 & 1 \\ -5690 & 3923 & 313 & -794 & 224 & -25 & 1 \\ -5850 & 3955 & 313 & -794 & 224 & -25 & 1 \\ -6010 & 3987 & 313 & -794 & 224 & -25 & 1 \\ -7638 & 4799 & 197 & -790 & 224 & -25 & 1 \\ -6838 & 4479 & 229 & -790 & 224 & -25 & 1 \\ -6998 & 4511 & 229 & -790 & 224 & -25 & 1 \\ -7254 & 4575 & 229 & -790 & 224 & -25 & 1 \\ -8178 & 5147 & 129 & -786 & 224 & -25 & 1 \\ -7538 & 4859 & 161 & -786 & 224 & -25 & 1 \\ -8670 & 5479 & 61 & -782 & 224 & -25 & 1 \\ -8030 & 5191 & 93 & -782 & 224 & -25 & 1 \\ -8190 & 5223 & 93 & -782 & 224 & -25 & 1 \\ -7390 & 4903 & 125 & -782 & 224 & -25 & 1 \\ -8970 & 5699 & 9 & -778 & 224 & -25 & 1 \\ -8330 & 5411 & 41 & -778 & 224 & -25 & 1 \\ -8490 & 5443 & 41 & -778 & 224 & -25 & 1 \\ -9478 & 5967 & -43 & -774 & 224 & -25 & 1 \\ -10670 & 6679 & -179 & -766 & 224 & -25 & 1 \\ -10970 & 6899 & -231 & -762 & 224 & -25 & 1 \end{pmatrix}$$

```
gsub = CoefficientList[D[chisub, x] / mu[chisub] // Factor, x]
```

```
{-31400, 22692, 27148, -23400, 6272, -700, 28}
```

```
FindInstance[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 && n[4] ≥ 0 && n[5] ≥ 0 && n[6] ≥ 0 &&
  n[7] ≥ 0 && n[8] ≥ 0 && n[9] ≥ 0 && n[10] ≥ 0 && n[11] ≥ 0 && n[12] ≥ 0 && n[13] ≥ 0 &&
  n[14] ≥ 0 && n[15] ≥ 0 && n[16] ≥ 0 && n[17] ≥ 0 && n[18] ≥ 0 && n[19] ≥ 0 && n[20] ≥ 0 &&
  n[21] ≥ 0 && n[22] ≥ 0 && n[23] ≥ 0 && n[24] ≥ 0 && n[25] ≥ 0 && n[26] ≥ 0 &&
  n[27] ≥ 0 && n[28] ≥ 0 && n[29] ≥ 0 && n[30] ≥ 0 && n[31] ≥ 0 && n[32] ≥ 0 &&
  n[33] ≥ 0 && n[34] ≥ 0 && n[35] ≥ 0 && n[36] ≥ 0 && n[37] ≥ 0 && n[38] ≥ 0 &&
  n[39] ≥ 0 && n[40] ≥ 0 && n[41] ≥ 0 && n[42] ≥ 0 && n[43] ≥ 0 && n[44] ≥ 0 &&
  n[45] ≥ 0 && n[46] ≥ 0 && n[47] ≥ 0 && n[48] ≥ 0 && n[49] ≥ 0 && n[50] ≥ 0 &&
  n[51] ≥ 0 && n[52] ≥ 0 && n[53] ≥ 0 && n[54] ≥ 0 && n[55] ≥ 0 && n[56] ≥ 0 &&
  n[57] ≥ 0 && n[58] ≥ 0 && n[59] ≥ 0 && n[60] ≥ 0 && n[61] ≥ 0 && n[62] ≥ 0 &&
  n[63] ≥ 0 && n[64] ≥ 0 && n[65] ≥ 0 && n[66] ≥ 0 && n[67] ≥ 0 && n[68] ≥ 0 &&
  n[69] ≥ 0 && n[70] ≥ 0 && n[71] ≥ 0 && n[72] ≥ 0 && n[73] ≥ 0 && n[74] ≥ 0 &&
  n[75] ≥ 0 && n[76] ≥ 0 && n[77] ≥ 0 && n[78] ≥ 0 && n[79] ≥ 0 && n[80] ≥ 0 &&
  n[81] ≥ 0 && n[82] ≥ 0 && n[83] ≥ 0 && n[84] ≥ 0 && n[85] ≥ 0 && n[86] ≥ 0 &&
  n[87] ≥ 0 && n[88] ≥ 0 && n[89] ≥ 0 && n[90] ≥ 0 && n[91] ≥ 0 && n[92] ≥ 0 &&
  n[93] ≥ 0 && n[94] ≥ 0 && n[95] ≥ 0 && n[96] ≥ 0 && n[97] ≥ 0 && n[98] ≥ 0 &&
  n[99] ≥ 0 && n[100] ≥ 0 && n[101] ≥ 0 && n[102] ≥ 0 && n[103] ≥ 0 && n[104] ≥ 0 &&
  n[105] ≥ 0 && n[106] ≥ 0 && n[107] ≥ 0 && n[108] ≥ 0 && n[109] ≥ 0 && n[110] ≥ 0 &&
  n[111] ≥ 0 && n[112] ≥ 0 && n[113] ≥ 0 && n[114] ≥ 0 && n[115] ≥ 0 && n[116] ≥ 0 &&
  n[117] ≥ 0 && n[118] ≥ 0 && n[119] ≥ 0 && n[120] ≥ 0 && n[121] ≥ 0 && n[122] ≥ 0 &&
  n[123] ≥ 0 && n[124] ≥ 0 && Array[n, 124].Asub == gsub, Array[n, 124], Integers]
```

```
{{n[1] → 10, n[2] → 0, n[3] → 4, n[4] → 2, n[5] → 0, n[6] → 0, n[7] → 2, n[8] → 0,
  n[9] → 0, n[10] → 0, n[11] → 0, n[12] → 0, n[13] → 1, n[14] → 7, n[15] → 0,
  n[16] → 0, n[17] → 0, n[18] → 0, n[19] → 0, n[20] → 0, n[21] → 0, n[22] → 0,
  n[23] → 0, n[24] → 0, n[25] → 0, n[26] → 0, n[27] → 0, n[28] → 0, n[29] → 0,
  n[30] → 0, n[31] → 0, n[32] → 0, n[33] → 0, n[34] → 0, n[35] → 0, n[36] → 0,
  n[37] → 0, n[38] → 0, n[39] → 0, n[40] → 1, n[41] → 1, n[42] → 0, n[43] → 0,
  n[44] → 0, n[45] → 0, n[46] → 0, n[47] → 0, n[48] → 0, n[49] → 0, n[50] → 0,
  n[51] → 0, n[52] → 0, n[53] → 0, n[54] → 0, n[55] → 0, n[56] → 0, n[57] → 0,
  n[58] → 0, n[59] → 0, n[60] → 0, n[61] → 0, n[62] → 0, n[63] → 0, n[64] → 0,
  n[65] → 0, n[66] → 0, n[67] → 0, n[68] → 0, n[69] → 0, n[70] → 0, n[71] → 0,
  n[72] → 0, n[73] → 0, n[74] → 0, n[75] → 0, n[76] → 0, n[77] → 0, n[78] → 0,
  n[79] → 0, n[80] → 0, n[81] → 0, n[82] → 0, n[83] → 0, n[84] → 0, n[85] → 0,
  n[86] → 0, n[87] → 0, n[88] → 0, n[89] → 0, n[90] → 0, n[91] → 0, n[92] → 0,
  n[93] → 0, n[94] → 0, n[95] → 0, n[96] → 0, n[97] → 0, n[98] → 0, n[99] → 0,
  n[100] → 0, n[101] → 0, n[102] → 0, n[103] → 0, n[104] → 0, n[105] → 0, n[106] → 0,
  n[107] → 0, n[108] → 0, n[109] → 0, n[110] → 0, n[111] → 0, n[112] → 0,
  n[113] → 0, n[114] → 0, n[115] → 0, n[116] → 0, n[117] → 0, n[118] → 0,
  n[119] → 0, n[120] → 0, n[121] → 0, n[122] → 0, n[123] → 0, n[124] → 0}}
```

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

```
{-554 c[1] + 387 c[2] + 1065 c[3] - 842 c[4] + 224 c[5] - 25 c[6] + c[7],
 -390 c[1] + 495 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7],
 -550 c[1] + 527 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7],
 -806 c[1] + 591 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7],
 -994 c[1] + 843 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
 -1090 c[1] + 875 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
```

```
-1346 c[1] + 939 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
-98 c[1] + 491 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
-34 c[1] + 491 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
-194 c[1] + 523 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
-354 c[1] + 555 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7],
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-1742 c[1] + 1239 c[2] + 877 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-1838 c[1] + 1271 c[2] + 877 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-270 c[1] + 759 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-430 c[1] + 791 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-590 c[1] + 823 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-526 c[1] + 823 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-750 c[1] + 855 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-686 c[1] + 855 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-846 c[1] + 887 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-942 c[1] + 919 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
50 c[1] + 535 c[2] + 941 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7],
-1530 c[1] + 1331 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-1466 c[1] + 1331 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-1626 c[1] + 1363 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-1786 c[1] + 1395 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
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-2042 c[1] + 1459 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-410 c[1] + 947 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-570 c[1] + 979 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-730 c[1] + 1011 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-890 c[1] + 1043 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
-826 c[1] + 1043 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
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-986 c[1] + 1075 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
70 c[1] + 691 c[2] + 889 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7],
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-3030 c[1] + 1983 c[2] + 741 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
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-2038 c[1] + 1599 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-1974 c[1] + 1599 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-2134 c[1] + 1631 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-2294 c[1] + 1663 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-918 c[1] + 1215 c[2] + 805 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-1078 c[1] + 1247 c[2] + 805 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7],
-3314 c[1] + 2267 c[2] + 673 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-3474 c[1] + 2299 c[2] + 673 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-2258 c[1] + 1883 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-2418 c[1] + 1915 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-2578 c[1] + 1947 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
```

```
-2674 c[1] + 1979 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-2834 c[1] + 2011 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-1618 c[1] + 1595 c[2] + 737 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7],
-3806 c[1] + 2599 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3966 c[1] + 2631 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-4222 c[1] + 2695 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-2750 c[1] + 2215 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-2910 c[1] + 2247 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3070 c[1] + 2279 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3230 c[1] + 2311 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3166 c[1] + 2311 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3326 c[1] + 2343 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3422 c[1] + 2375 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-2110 c[1] + 1927 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-2270 c[1] + 1959 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-2430 c[1] + 1991 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7],
-3850 c[1] + 2755 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-4010 c[1] + 2787 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-4106 c[1] + 2819 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-4266 c[1] + 2851 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-4522 c[1] + 2915 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-3050 c[1] + 2435 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-3210 c[1] + 2467 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-3370 c[1] + 2499 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-3530 c[1] + 2531 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-3466 c[1] + 2531 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-2410 c[1] + 2147 c[2] + 617 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7],
-4998 c[1] + 3311 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-5158 c[1] + 3343 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-5254 c[1] + 3375 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-4358 c[1] + 3023 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-4518 c[1] + 3055 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-4614 c[1] + 3087 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-4774 c[1] + 3119 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-3558 c[1] + 2703 c[2] + 533 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7],
-5698 c[1] + 3691 c[2] + 401 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7],
-5954 c[1] + 3755 c[2] + 401 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7],
-4898 c[1] + 3371 c[2] + 433 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7],
-5058 c[1] + 3403 c[2] + 433 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7],
-5314 c[1] + 3467 c[2] + 433 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7],
-6030 c[1] + 3991 c[2] + 333 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-6190 c[1] + 4023 c[2] + 333 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-6446 c[1] + 4087 c[2] + 333 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-5390 c[1] + 3703 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-5550 c[1] + 3735 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-5710 c[1] + 3767 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
-5806 c[1] + 3799 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
```

```
 -4750 c[1] + 3415 c[2] + 397 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
 -4910 c[1] + 3447 c[2] + 397 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7],
 -7386 c[1] + 4595 c[2] + 249 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -6490 c[1] + 4243 c[2] + 281 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -6746 c[1] + 4307 c[2] + 281 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -5690 c[1] + 3923 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -5850 c[1] + 3955 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -6010 c[1] + 3987 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7],
 -7638 c[1] + 4799 c[2] + 197 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7],
 -6838 c[1] + 4479 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7],
 -6998 c[1] + 4511 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7],
 -7254 c[1] + 4575 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8178 c[1] + 5147 c[2] + 129 c[3] - 786 c[4] + 224 c[5] - 25 c[6] + c[7],
 -7538 c[1] + 4859 c[2] + 161 c[3] - 786 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8670 c[1] + 5479 c[2] + 61 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8030 c[1] + 5191 c[2] + 93 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8190 c[1] + 5223 c[2] + 93 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7],
 -7390 c[1] + 4903 c[2] + 125 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8970 c[1] + 5699 c[2] + 9 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8330 c[1] + 5411 c[2] + 41 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7],
 -8490 c[1] + 5443 c[2] + 41 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7],
 -9478 c[1] + 5967 c[2] - 43 c[3] - 774 c[4] + 224 c[5] - 25 c[6] + c[7],
 -10 670 c[1] + 6679 c[2] - 179 c[3] - 766 c[4] + 224 c[5] - 25 c[6] + c[7],
 -10 970 c[1] + 6899 c[2] - 231 c[3] - 762 c[4] + 224 c[5] - 25 c[6] + c[7]}
```

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

```
-31 400 c[1] + 22 692 c[2] + 27 148 c[3] - 23 400 c[4] + 6272 c[5] - 700 c[6] + 28 c[7]
```

```
warrantsub = Flatten[Array[c, 7] /. FindInstance[
    -31 400 c[1] + 22 692 c[2] + 27 148 c[3] - 23 400 c[4] + 6272 c[5] - 700 c[6] + 28 c[7] <
      0 && -554 c[1] + 387 c[2] + 1065 c[3] - 842 c[4] + 224 c[5] - 25 c[6] + c[7] < 0 &&
     -390 c[1] + 495 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -550 c[1] + 527 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -806 c[1] + 591 c[2] + 1013 c[3] - 838 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -994 c[1] + 843 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -1090 c[1] + 875 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -1346 c[1] + 939 c[2] + 945 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -98 c[1] + 491 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -34 c[1] + 491 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -194 c[1] + 523 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -354 c[1] + 555 c[2] + 977 c[3] - 834 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -1582 c[1] + 1207 c[2] + 877 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -1742 c[1] + 1239 c[2] + 877 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -1838 c[1] + 1271 c[2] + 877 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -270 c[1] + 759 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -430 c[1] + 791 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
     -590 c[1] + 823 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
```

```
-526 c[1] + 823 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-750 c[1] + 855 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-686 c[1] + 855 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-846 c[1] + 887 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-942 c[1] + 919 c[2] + 909 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
50 c[1] + 535 c[2] + 941 c[3] - 830 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1530 c[1] + 1331 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1466 c[1] + 1331 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1626 c[1] + 1363 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1786 c[1] + 1395 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1882 c[1] + 1427 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2042 c[1] + 1459 c[2] + 825 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-410 c[1] + 947 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-570 c[1] + 979 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-730 c[1] + 1011 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-890 c[1] + 1043 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-826 c[1] + 1043 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1050 c[1] + 1075 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-986 c[1] + 1075 c[2] + 857 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
70 c[1] + 691 c[2] + 889 c[3] - 826 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2614 c[1] + 1887 c[2] + 741 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2774 c[1] + 1919 c[2] + 741 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3030 c[1] + 1983 c[2] + 741 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1718 c[1] + 1535 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1878 c[1] + 1567 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2038 c[1] + 1599 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1974 c[1] + 1599 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2134 c[1] + 1631 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2294 c[1] + 1663 c[2] + 773 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-918 c[1] + 1215 c[2] + 805 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1078 c[1] + 1247 c[2] + 805 c[3] - 822 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3314 c[1] + 2267 c[2] + 673 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3474 c[1] + 2299 c[2] + 673 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2258 c[1] + 1883 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2418 c[1] + 1915 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2578 c[1] + 1947 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2674 c[1] + 1979 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2834 c[1] + 2011 c[2] + 705 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-1618 c[1] + 1595 c[2] + 737 c[3] - 818 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3806 c[1] + 2599 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3966 c[1] + 2631 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4222 c[1] + 2695 c[2] + 605 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2750 c[1] + 2215 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2910 c[1] + 2247 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3070 c[1] + 2279 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3230 c[1] + 2311 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3166 c[1] + 2311 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
```

```
-3326 c[1] + 2343 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3422 c[1] + 2375 c[2] + 637 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2110 c[1] + 1927 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2270 c[1] + 1959 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2430 c[1] + 1991 c[2] + 669 c[3] - 814 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3850 c[1] + 2755 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4010 c[1] + 2787 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4106 c[1] + 2819 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4266 c[1] + 2851 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4522 c[1] + 2915 c[2] + 553 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3050 c[1] + 2435 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3210 c[1] + 2467 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3370 c[1] + 2499 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3530 c[1] + 2531 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3466 c[1] + 2531 c[2] + 585 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-2410 c[1] + 2147 c[2] + 617 c[3] - 810 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4998 c[1] + 3311 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5158 c[1] + 3343 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5254 c[1] + 3375 c[2] + 469 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4358 c[1] + 3023 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4518 c[1] + 3055 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4614 c[1] + 3087 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4774 c[1] + 3119 c[2] + 501 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-3558 c[1] + 2703 c[2] + 533 c[3] - 806 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5698 c[1] + 3691 c[2] + 401 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5954 c[1] + 3755 c[2] + 401 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4898 c[1] + 3371 c[2] + 433 c[3] - 802 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
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-6190 c[1] + 4023 c[2] + 333 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6446 c[1] + 4087 c[2] + 333 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5390 c[1] + 3703 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5550 c[1] + 3735 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5710 c[1] + 3767 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5806 c[1] + 3799 c[2] + 365 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4750 c[1] + 3415 c[2] + 397 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-4910 c[1] + 3447 c[2] + 397 c[3] - 798 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-7386 c[1] + 4595 c[2] + 249 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6490 c[1] + 4243 c[2] + 281 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6746 c[1] + 4307 c[2] + 281 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5690 c[1] + 3923 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-5850 c[1] + 3955 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6010 c[1] + 3987 c[2] + 313 c[3] - 794 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-7638 c[1] + 4799 c[2] + 197 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6838 c[1] + 4479 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
-6998 c[1] + 4511 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
```

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    -7254 c[1] + 4575 c[2] + 229 c[3] - 790 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8178 c[1] + 5147 c[2] + 129 c[3] - 786 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -7538 c[1] + 4859 c[2] + 161 c[3] - 786 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8670 c[1] + 5479 c[2] + 61 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8030 c[1] + 5191 c[2] + 93 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8190 c[1] + 5223 c[2] + 93 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -7390 c[1] + 4903 c[2] + 125 c[3] - 782 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8970 c[1] + 5699 c[2] + 9 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8330 c[1] + 5411 c[2] + 41 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -8490 c[1] + 5443 c[2] + 41 c[3] - 778 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -9478 c[1] + 5967 c[2] - 43 c[3] - 774 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -10 670 c[1] + 6679 c[2] - 179 c[3] - 766 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0 &&
    -10 970 c[1] + 6899 c[2] - 231 c[3] - 762 c[4] + 224 c[5] - 25 c[6] + c[7] ≥ 0,
  Array[c, 7], Integers]]
{-344, -1486, -5303, -7130, 0, 0, 0}

GCD[-344, -1486, -5303, -7130, 0, 0, 0]
1

Reverse[warrantsub]
{0, 0, 0, -7130, -5303, -1486, -344}

warrantsub.gsub
-42 556

warrantsub.Transpose[Asub]
{-28 741, 1591, 9079, 2039, 24 323, 9795, 2755, 69 475, 47 459, 54 947, 62 435,
 17 775, 25 263, 10 735, 62 479, 69 967, 77 455, 55 439, 84 943, 62 927, 70 415,
 55 887, 115 567, 62 859, 40 843, 48 331, 55 819, 41 291, 48 779, 78 507, 85 995,
 93 483, 100 971, 78 955, 108 459, 86 443, 124 107, 26 471, 33 959, 26 919,
 71 623, 79 111, 86 599, 64 583, 72 071, 79 559, 102 247, 109 735, 34 675, 42 163,
 72 339, 79 827, 87 315, 72 787, 80 275, 110 451, 42 655, 50 143, 43 103, 80 319,
 87 807, 95 295, 102 783, 80 767, 88 255, 73 727, 118 431, 125 919, 133 407,
 73 211, 80 699, 66 171, 73 659, 66 619, 103 835, 111 323, 118 811, 126 299,
 104 283, 141 947, 58 839, 66 327, 51 799, 96 951, 104 439, 89 911, 97 399,
 127 575, 67 043, 60 003, 97 667, 105 155, 98 115, 67 535, 75 023, 67 983, 105 647,
 113 135, 120 623, 106 095, 143 759, 151 247, 53 387, 98 539, 91 499, 129 163,
 136 651, 144 139, 84 167, 114 791, 122 279, 115 239, 84 883, 122 995, 92 863,
 130 975, 138 463, 169 087, 116 379, 154 491, 161 979, 140 119, 156 303, 179 819}
```

In[•]:=
```
listmod128 = {(-5 + x)^9 (5 + x)^13 (150 - 141 x - 210 x^2 + 124 x^3 - 20 x^4 + x^5),
  (-5 + x)^8 (5 + x)^13 (-686 + 855 x + 909 x^2 - 830 x^3 + 224 x^4 - 25 x^5 + x^6),
  (-5 + x)^9 (1 + x) (5 + x)^13 (178 - 351 x + 145 x^2 - 21 x^3 + x^4),
  (-5 + x)^8 (5 + x)^13 (-6446 + 4087 x + 333 x^2 - 798 x^3 + 224 x^4 - 25 x^5 + x^6),
  (-5 + x)^8 (5 + x)^13 (-942 + 919 x + 909 x^2 - 830 x^3 + 224 x^4 - 25 x^5 + x^6),
```

$$(-5+x)^8\,(5+x)^{13}\left(-826+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(114-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-390+495\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-550+527\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(31-12\,x+x^2\right)\left(-26+9\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-994+843\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1090+875\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1346+939\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-98+491\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(17+35\,x-13\,x^2+x^3\right)\left(-2+33\,x-12\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-194+523\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-354+555\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1582+1207\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1742+1239\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1838+1271\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^9\,(5+x)^{13}\left(-6+15\,x+25\,x^2-11\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(86-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(118-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-526+823\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-846+887\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(-1-8\,x+x^2\right)\left(10+29\,x-12\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)^9\,(-1+x)\,(5+x)^{13}\left(34+15\,x-10\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1466+1331\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1626+1363\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1786+1395\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1882+1427\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2042+1459\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(82-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(146-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(210-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-986+1075\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(-1-8\,x+x^2\right)\left(14+29\,x-12\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2614+1887\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2774+1919\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3030+1983\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1718+1535\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1878+1567\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2038+1599\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-42+51\,x-14\,x^2+x^3\right)\left(47+19\,x-11\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2134+1631\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(31-12\,x+x^2\right)\left(-74+25\,x+37\,x^2-13\,x^3+x^4\right),$$

$$(-5+x)^8\,(5+x)^{13}\left(-918+1215\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1078+1247\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3314+2267\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3474+2299\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2258+1883\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2418+1915\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2578+1947\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-2674+1979\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(13-10\,x+x^2\right)\left(-218-13\,x+61\,x^2-15\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-1618+1595\,x+737\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3806+2599\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3966+2631\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4222+2695\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(550-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(582-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(614-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(646-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3166+2311\,x+637\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3326+2343\,x+637\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-58+55\,x-14\,x^2+x^3\right)\left(59+15\,x-11\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(422-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(454-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(486-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^9\,(5+x)^{13}\left(-110+41\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(802-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4106+2819\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4266+2851\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(38-13\,x+x^2\right)\left(17-10\,x+x^2\right)\left(-7-2\,x+x^2\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(610-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(642-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(674-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(706-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3466+2531\,x+585\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^9\,(5+x)^{13}\left(482-333\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)^8\,(5+x)^{13}\left(714-371\,x-120\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-5158+3343\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-74+59\,x-14\,x^2+x^3\right)\left(71+11\,x-11\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4358+3023\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4518+3055\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-4614+3087\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(31-12\,x+x^2\right)\left(-154+41\,x+37\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)^8\,(5+x)^{13}\left(-3558+2703\,x+533\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6\right),$$

```
(-7 + x) (-5 + x)^8 (5 + x)^13 (814 - 411 x - 116 x^2 + 98 x^3 - 18 x^4 + x^5),
(-5 + x)^8 (5 + x)^13 (-5954 + 3755 x + 401 x^2 - 802 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^8 (5 + x)^13 (-4898 + 3371 x + 433 x^2 - 802 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^8 (5 + x)^13 (-5058 + 3403 x + 433 x^2 - 802 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^8 (5 + x)^13 (-5314 + 3467 x + 433 x^2 - 802 x^3 + 224 x^4 - 25 x^5 + x^6),
(-9 + x) (-5 + x)^9 (5 + x)^13 (-134 + 47 x + 25 x^2 - 11 x^3 + x^4),
(-5 + x)^9 (5 + x)^13 (1238 - 557 x - 178 x^2 + 124 x^3 - 20 x^4 + x^5),
(-7 + x) (-5 + x)^9 (5 + x)^13 (-154 + 53 x + 33 x^2 - 13 x^3 + x^4),
(-5 + x)^9 (5 + x)^13 (1110 - 525 x - 178 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (1142 - 525 x - 178 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^8 (5 + x)^13 (-5806 + 3799 x + 365 x^2 - 798 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^9 (5 + x)^13 (950 - 493 x - 178 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (982 - 493 x - 178 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^8 (-3 + x) (5 + x)^13 (2462 - 711 x - 320 x^2 + 158 x^3 - 22 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (1298 - 589 x - 174 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^8 (5 + x)^13 (-6746 + 4307 x + 281 x^2 - 794 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^9 (5 + x)^13 (1138 - 557 x - 174 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (1170 - 557 x - 174 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (1202 - 557 x - 174 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^8 (-3 + x) (5 + x)^13 (2546 - 751 x - 316 x^2 + 158 x^3 - 22 x^4 + x^5),
(-5 + x)^8 (5 + x)^13 (-6838 + 4479 x + 229 x^2 - 790 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^8 (5 + x)^13 (-6998 + 4511 x + 229 x^2 - 790 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^8 (-3 + x) (5 + x)^13 (31 - 12 x + x^2) (78 + 7 x - 10 x^2 + x^3),
(-5 + x)^8 (-3 + x) (5 + x)^13 (2726 - 807 x - 312 x^2 + 158 x^3 - 22 x^4 + x^5),
(-5 + x)^8 (5 + x)^13 (-7538 + 4859 x + 161 x^2 - 786 x^3 + 224 x^4 - 25 x^5 + x^6),
(-5 + x)^9 (-3 + x) (5 + x)^13 (-578 + 57 x + 73 x^2 - 17 x^3 + x^4),
(-5 + x)^9 (5 + x)^13 (1606 - 717 x - 162 x^2 + 124 x^3 - 20 x^4 + x^5),
(-7 + x) (-5 + x)^9 (-3 + x) (5 + x)^13 (78 + 3 x - 10 x^2 + x^3),
(-5 + x)^9 (5 + x)^13 (1478 - 685 x - 162 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (-3 + x) (5 + x)^13 (-598 + 61 x + 73 x^2 - 17 x^3 + x^4),
(-7 + x) (-5 + x)^9 (5 + x)^13 (-238 + 73 x + 33 x^2 - 13 x^3 + x^4),
(-5 + x)^9 (-3 + x) (5 + x)^13 (-566 + 61 x + 73 x^2 - 17 x^3 + x^4),
(-7 + x) (-5 + x)^8 (5 + x)^13 (1354 - 659 x - 88 x^2 + 98 x^3 - 18 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (2134 - 909 x - 146 x^2 + 124 x^3 - 20 x^4 + x^5),
(-5 + x)^9 (5 + x)^13 (2194 - 941 x - 142 x^2 + 124 x^3 - 20 x^4 + x^5)};
```

In[ ]:=
```
Length[listmod128]
```
Out[ ]=
```
124
```

In[ ]:=
```
listmod128[[8]]
```
Out[ ]=
```
(-5 + x)^8 (5 + x)^13 (-554 + 387 x + 1065 x^2 - 842 x^3 + 224 x^4 - 25 x^5 + x^6)
```

In[ ]:=
```
listmod128 = listmod128 / mu[chisub] // Factor
```
Out[ ]=
```
{(-5 + x) (150 - 141 x - 210 x^2 + 124 x^3 - 20 x^4 + x^5),
 -686 + 855 x + 909 x^2 - 830 x^3 + 224 x^4 - 25 x^5 + x^6,
```

$$(-5+x)\,(1+x)\,\left(178-351\,x+145\,x^2-21\,x^3+x^4\right),$$
$$-6446+4087\,x+333\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-942+919\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-826+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(114-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-390+495\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-550+527\,x+1013\,x^2-838\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-26+9\,x+37\,x^2-13\,x^3+x^4\right),$$
$$-994+843\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1090+875\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1346+939\,x+945\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-98+491\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(17+35\,x-13\,x^2+x^3\right)\,\left(-2+33\,x-12\,x^2+x^3\right),$$
$$-194+523\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-354+555\,x+977\,x^2-834\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1582+1207\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1742+1239\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1838+1271\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-5+x)\,\left(-6+15\,x+25\,x^2-11\,x^3+x^4\right),$$
$$(-5+x)\,\left(86-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(118-141\,x-210\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-526+823\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-846+887\,x+909\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(-1-8\,x+x^2\right)\,\left(10+29\,x-12\,x^2+x^3\right),$$
$$(-9+x)\,(-5+x)\,(-1+x)\,\left(34+15\,x-10\,x^2+x^3\right),$$
$$-1466+1331\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1626+1363\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1786+1395\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1882+1427\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2042+1459\,x+825\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(82-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(146-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(210-173\,x-206\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-986+1075\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(-1-8\,x+x^2\right)\,\left(14+29\,x-12\,x^2+x^3\right),$$
$$-2614+1887\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2774+1919\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3030+1983\,x+741\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1718+1535\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1878+1567\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2038+1599\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-42+51\,x-14\,x^2+x^3\right)\,\left(47+19\,x-11\,x^2+x^3\right),$$
$$-2134+1631\,x+773\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\,\left(-74+25\,x+37\,x^2-13\,x^3+x^4\right),$$

$$-918+1215\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1078+1247\,x+805\,x^2-822\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3314+2267\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3474+2299\,x+673\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2258+1883\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2418+1915\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2578+1947\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-2674+1979\,x+705\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(13-10\,x+x^2\right)\left(-218-13\,x+61\,x^2-15\,x^3+x^4\right),$$
$$-1618+1595\,x+737\,x^2-818\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3806+2599\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3966+2631\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4222+2695\,x+605\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(550-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(582-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(614-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(646-333\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3166+2311\,x+637\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-3326+2343\,x+637\,x^2-814\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-58+55\,x-14\,x^2+x^3\right)\left(59+15\,x-11\,x^2+x^3\right),$$
$$(-5+x)\left(422-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(454-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(486-301\,x-194\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)(-5+x)\left(-110+41\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\left(802-397\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-4106+2819\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4266+2851\,x+553\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(38-13\,x+x^2\right)\left(17-10\,x+x^2\right)\left(-7-2\,x+x^2\right),$$
$$(-5+x)\left(610-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(642-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(674-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\left(706-365\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-3466+2531\,x+585\,x^2-810\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\left(482-333\,x-190\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\left(714-371\,x-120\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$-5158+3343\,x+469\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(-74+59\,x-14\,x^2+x^3\right)\left(71+11\,x-11\,x^2+x^3\right),$$
$$-4358+3023\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4518+3055\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4614+3087\,x+501\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$\left(31-12\,x+x^2\right)\left(-154+41\,x+37\,x^2-13\,x^3+x^4\right),$$
$$-3558+2703\,x+533\,x^2-806\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-7+x)\left(814-411\,x-116\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$-5954+3755\,x+401\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-4898+3371\,x+433\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$

$$-5058+3403\,x+433\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-5314+3467\,x+433\,x^2-802\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-5+x)\,\left(-134+47\,x+25\,x^2-11\,x^3+x^4\right),$$
$$(-5+x)\,\left(1238-557\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)\,\left(-154+53\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\,\left(1110-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(1142-525\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-5806+3799\,x+365\,x^2-798\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(950-493\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(982-493\,x-178\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-3+x)\,\left(2462-711\,x-320\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$(-5+x)\,\left(1298-589\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$-6746+4307\,x+281\,x^2-794\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,\left(1138-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(1170-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(1202-557\,x-174\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-3+x)\,\left(2546-751\,x-316\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$-6838+4479\,x+229\,x^2-790\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-6998+4511\,x+229\,x^2-790\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-3+x)\,\left(31-12\,x+x^2\right)\,\left(78+7\,x-10\,x^2+x^3\right),$$
$$(-3+x)\,\left(2726-807\,x-312\,x^2+158\,x^3-22\,x^4+x^5\right),$$
$$-7538+4859\,x+161\,x^2-786\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-5+x)\,(-3+x)\,\left(-578+57\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-5+x)\,\left(1606-717\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-7+x)\,(-5+x)\,(-3+x)\,\left(78+3\,x-10\,x^2+x^3\right),$$
$$(-5+x)\,\left(1478-685\,x-162\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,(-3+x)\,\left(-598+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-7+x)\,(-5+x)\,\left(-238+73\,x+33\,x^2-13\,x^3+x^4\right),$$
$$(-5+x)\,(-3+x)\,\left(-566+61\,x+73\,x^2-17\,x^3+x^4\right),$$
$$(-7+x)\,\left(1354-659\,x-88\,x^2+98\,x^3-18\,x^4+x^5\right),$$
$$(-5+x)\,\left(2134-909\,x-146\,x^2+124\,x^3-20\,x^4+x^5\right),$$
$$(-5+x)\,\left(2194-941\,x-142\,x^2+124\,x^3-20\,x^4+x^5\right)\}$$

$$\mathbf{warrantpolysub = -826+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6}$$
$$-826+1043\,x+857\,x^2-826\,x^3+224\,x^4-25\,x^5+x^6$$

In[ ]:= **listmod128[[{8, 20, 28, 38, 67}]]**

Out[ ]= $\{-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$
$-1742+1239\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$
$(-9+x)\,(-5+x)\,(-1+x)\,\left(34+15\,x-10\,x^2+x^3\right),$
$(-5+x)\,\left(-1-8\,x+x^2\right)\,\left(14+29\,x-12\,x^2+x^3\right),$
$\left(-58+55\,x-14\,x^2+x^3\right)\,\left(59+15\,x-11\,x^2+x^3\right)\}$

In[ ]:= **anglesquaredsubcheckcompatible = anglesquaredsub[[{8, 20, 28, 38, 67}]];**

In[ ]:= anglesquaredsubcheckcompatible // MatrixForm

Out[ ]//MatrixForm=

$$\begin{pmatrix} \frac{5674}{11\,165} & \frac{1}{440}\left(5+\sqrt{5}\right) & \frac{25-3\sqrt{5}}{1160} & \frac{1}{440}\left(5-\sqrt{5}\right) & \frac{2}{5} & \frac{25+3\sqrt{5}}{1160} & \frac{2}{77} \\ \frac{5492}{11\,165} & -\frac{9}{440}\left(-5+\sqrt{5}\right) & \frac{45-17\sqrt{5}}{1160} & \frac{9}{440}\left(5+\sqrt{5}\right) & \frac{1}{5} & \frac{45+17\sqrt{5}}{1160} & \frac{2}{77} \\ \frac{156}{319} & \frac{1}{440}\left(65-19\sqrt{5}\right) & \frac{1}{232}\left(25-3\sqrt{5}\right) & \frac{1}{440}\left(65+19\sqrt{5}\right) & 0 & \frac{1}{232}\left(25+3\sqrt{5}\right) & 0 \\ \frac{1112}{2233} & \frac{5}{88}-\frac{1}{8\sqrt{5}} & \frac{165+73\sqrt{5}}{1160} & \frac{5}{88}+\frac{1}{8\sqrt{5}} & 0 & \frac{165-73\sqrt{5}}{1160} & \frac{8}{77} \\ \frac{5252}{11\,165} & \frac{5}{88}+\frac{1}{8\sqrt{5}} & \frac{65+27\sqrt{5}}{1160} & \frac{5}{88}-\frac{1}{8\sqrt{5}} & \frac{1}{5} & \frac{65-27\sqrt{5}}{1160} & \frac{8}{77} \end{pmatrix}$$

In[ ]:= anglesubcheckcompatible = Sqrt[anglesquaredsubcheckcompatible] // FullSimplify;

In[ ]:= anglesubcheckcompatible // MatrixForm

Out[ ]//MatrixForm=

$$\begin{pmatrix} \sqrt{\frac{5674}{11\,165}} & \frac{1}{2}\sqrt{\frac{1}{110}\left(5+\sqrt{5}\right)} & 0.126\ldots & 0.0793\ldots & \sqrt{\frac{2}{5}} & \sqrt{\frac{5}{232}+\frac{3}{232\sqrt{5}}} & \sqrt{\frac{2}{77}} \\ 2\sqrt{\frac{1373}{11\,165}} & \frac{3}{2}\sqrt{\frac{1}{110}\left(5-\sqrt{5}\right)} & 0.0776\ldots & \frac{3}{2}\sqrt{\frac{1}{110}\left(5+\sqrt{5}\right)} & \frac{1}{\sqrt{5}} & \sqrt{\frac{9}{232}+\frac{17}{232\sqrt{5}}} & \sqrt{\frac{2}{77}} \\ 2\sqrt{\frac{39}{319}} & 0.226\ldots & 0.281\ldots & \sqrt{\frac{13}{88}+\frac{19}{88\sqrt{5}}} & 0 & \sqrt{\frac{25}{232}+\frac{3\sqrt{5}}{232}} & 0 \\ 2\sqrt{\frac{278}{2233}} & \sqrt{\frac{5}{88}-\frac{1}{8\sqrt{5}}} & 0.532\ldots & \sqrt{\frac{5}{88}+\frac{1}{8\sqrt{5}}} & 0 & 0.0390\ldots & 2\sqrt{\frac{2}{77}} \\ 2\sqrt{\frac{1313}{11\,165}} & \sqrt{\frac{5}{88}+\frac{1}{8\sqrt{5}}} & 0.329\ldots & \sqrt{\frac{5}{88}-\frac{1}{8\sqrt{5}}} & \frac{1}{\sqrt{5}} & 0.0632\ldots & 2\sqrt{\frac{2}{77}} \end{pmatrix}$$

In[ ]:= chisub
orderedroots[minipoly[chisub]]

Out[ ]= $(-9+x)\,(-5+x)^9\,(5+x)^{14}\left(31-12x+x^2\right)\left(-1-4x+x^2\right)$

Out[ ]= $\left\{-5,\ 2-\sqrt{5},\ 6-\sqrt{5},\ 2+\sqrt{5},\ 5,\ 6+\sqrt{5},\ 9\right\}$

{7}, {2, 4}, {3, 6}, {2, 4, 7}, {3, 6, 7}, {2, 3, 4, 6}, {2, 3, 4, 6, 7}

In[ ]:= coeff[chisub, (x + 5) (x - 5) (x^2 - 4 x - 1) (x^2 - 12 x + 31)] // FullSimplify

Out[ ]= {9856}

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[MinimalPolynomial[
    combinationangle[{9856}, {1, i}, {7}, anglesubcheckcompatible], x]]]
]

1

1

1

1

1

In[ ]:= coeff[chisub, (x + 5) (x - 5) (x - 9) (x^2 - 12 x + 31)] // FullSimplify

Out[ ]= $\left\{352\left(11+5\sqrt{5}\right),\ 352\left(11-5\sqrt{5}\right)\right\}$

```
In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[
  MinimalPolynomial[combinationangle[{352 (11 + 5 √5), 352 (11 - 5 √5)},
   {1, i}, {2, 4}, anglesubcheckcompatible], x]]]
]
1
1
1
1
1

In[ ]:= coeff[chisub, (x + 5) (x - 5) (x - 9) (x^2 - 4 x - 1)] // FullSimplify
Out[ ]= {32 (-19 + 7 √5), -32 (19 + 7 √5)}

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[
  MinimalPolynomial[combinationangle[{32 (-19 + 7 √5), -32 (19 + 7 √5)},
   {1, i}, {3, 6}, anglesubcheckcompatible], x]]]
]
1
1
1
1
1
1

In[ ]:= coeff[chisub, (x + 5) (x - 5) (x^2 - 12 x + 31)] // FullSimplify
Out[ ]= {-32 (13 + 6 √5), 32 (-13 + 6 √5), 224}

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[
  MinimalPolynomial[combinationangle[{-32 (13 + 6 √5), 32 (-13 + 6 √5), 224},
   {1, i}, {2, 4, 7}, anglesubcheckcompatible], x]]]
]
1
1
1
1
1
```

```
In[ ]:= coeff[chisub, (x + 5) (x - 5) (x^2 - 4 x - 1)] // FullSimplify
Out[ ]= {736 - 320 √5 , 736 + 320 √5 , 2464}

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[
   MinimalPolynomial[combinationangle[{736 - 320 √5 , 736 + 320 √5 , 2464},
     {1, i}, {3, 6, 7}, anglesubcheckcompatible], x]]]
]
1
1
1
1
1

In[ ]:= coeff[chisub, (x + 5) (x - 5) (x - 9)] // FullSimplify
Out[ ]= {44 (3 + √5) , 4 (3 + 5 √5) , -44 (-3 + √5) , 12 - 20 √5 }

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[MinimalPolynomial[
    combinationangle[{44 (3 + √5), 4 (3 + 5 √5), -44 (-3 + √5), 12 - 20 √5},
     {1, i}, {2, 3, 4, 6}, anglesubcheckcompatible], x]]]
]
1
1
1
1
1

In[ ]:= coeff[chisub, (x + 5) (x - 5)] // FullSimplify
Out[ ]= {-4 (4 + √5) , 16 - 12 √5 , 4 (-4 + √5) , 4 (4 + 3 √5) , 56}

In[ ]:= For[i = 1, i ≤ 5, i++,
 Print[compatiblefrminipoly[MinimalPolynomial[
    combinationangle[{-4 (4 + √5), 16 - 12 √5 , 4 (-4 + √5), 4 (4 + 3 √5), 56},
     {1, i}, {2, 3, 4, 6, 7}, anglesubcheckcompatible], x]]]
]
```

```
1
1
1
1
1
```

In[ ]:=
```
anglesquaredsub = anglesquaredmat[chisub, listmod128] // FullSimplify;
```

In[ ]:=
```
anglesquaredsub // MatrixForm
```

Out[ ]//MatrixForm=

$$\begin{pmatrix}
\frac{1110}{2233} & \frac{17}{88}-\frac{3}{8\sqrt{5}} & \frac{45-17\sqrt{5}}{1160} & \frac{17}{88}+\frac{3}{8\sqrt{5}} & 0 & \frac{45+17\sqrt{5}}{1160} & \frac{3}{77} \\
\frac{793}{1595} & \frac{7}{88}-\frac{1}{8\sqrt{5}} & \frac{115+21\sqrt{5}}{1160} & \frac{7}{88}+\frac{1}{8\sqrt{5}} & \frac{1}{10} & \frac{115-21\sqrt{5}}{1160} & \frac{1}{22} \\
\frac{1101}{2233} & \frac{1}{440}\left(65-23\sqrt{5}\right) & \frac{85+13\sqrt{5}}{1160} & \frac{1}{440}\left(65+23\sqrt{5}\right) & 0 & \frac{85-13\sqrt{5}}{1160} & \frac{5}{77} \\
\frac{703}{1595} & \frac{1}{8}+\frac{17}{88\sqrt{5}} & \frac{95-23\sqrt{5}}{1160} & \frac{1}{8}-\frac{17}{88\sqrt{5}} & \frac{1}{10} & \frac{95+23\sqrt{5}}{1160} & \frac{1}{22} \\
\frac{5542}{11\,165} & \frac{1}{88}\left(5-\sqrt{5}\right) & \frac{65+27\sqrt{5}}{1160} & \frac{1}{88}\left(5+\sqrt{5}\right) & \frac{1}{5} & \frac{65-27\sqrt{5}}{1160} & \frac{6}{77} \\
\frac{5506}{11\,165} & \frac{1}{440}\left(15-\sqrt{5}\right) & \frac{155+51\sqrt{5}}{1160} & \frac{1}{440}\left(15+\sqrt{5}\right) & \frac{1}{10} & \frac{155-51\sqrt{5}}{1160} & \frac{1}{14} \\
\frac{1103}{2233} & \frac{1}{440}\left(25-7\sqrt{5}\right) & \frac{1}{232}\left(41+9\sqrt{5}\right) & \frac{1}{440}\left(25+7\sqrt{5}\right) & 0 & \frac{1}{232}\left(41-9\sqrt{5}\right) & \frac{3}{77} \\
\frac{5674}{11\,165} & \frac{1}{440}\left(5+\sqrt{5}\right) & \frac{25-3\sqrt{5}}{1160} & \frac{1}{440}\left(5-\sqrt{5}\right) & \frac{2}{5} & \frac{25+3\sqrt{5}}{1160} & \frac{2}{77} \\
\frac{1128}{2233} & \frac{1}{220}\left(5-\sqrt{5}\right) & \frac{1}{116}\left(11+\sqrt{5}\right) & \frac{1}{220}\left(5+\sqrt{5}\right) & \frac{1}{4} & \frac{1}{116}\left(11-\sqrt{5}\right) & \frac{3}{308} \\
\frac{161}{319} & \frac{1}{44}\left(3-\sqrt{5}\right) & \frac{1}{580}\left(25-3\sqrt{5}\right) & \frac{1}{44}\left(3+\sqrt{5}\right) & \frac{1}{4} & \frac{1}{580}\left(25+3\sqrt{5}\right) & \frac{1}{44} \\
\frac{194}{385} & \frac{1}{110}\left(5-\sqrt{5}\right) & 0 & \frac{1}{110}\left(5+\sqrt{5}\right) & \frac{7}{20} & 0 & \frac{17}{308} \\
\frac{5569}{11\,165} & \frac{1}{220}\left(25-8\sqrt{5}\right) & \frac{1}{116}\left(7-2\sqrt{5}\right) & \frac{1}{220}\left(25+8\sqrt{5}\right) & \frac{3}{20} & \frac{1}{116}\left(7+2\sqrt{5}\right) & \frac{1}{308} \\
\frac{159}{319} & \frac{1}{220}\left(10-\sqrt{5}\right) & \frac{1}{580}\left(40+\sqrt{5}\right) & \frac{1}{220}\left(10+\sqrt{5}\right) & \frac{1}{4} & \frac{1}{580}\left(40-\sqrt{5}\right) & \frac{1}{44} \\
\frac{5556}{11\,165} & \frac{1}{220}\left(5+2\sqrt{5}\right) & \frac{1}{580}\left(15+4\sqrt{5}\right) & \frac{1}{220}\left(5-2\sqrt{5}\right) & \frac{7}{20} & \frac{1}{580}\left(15-4\sqrt{5}\right) & \frac{17}{308} \\
\frac{5623}{11\,165} & \frac{1}{220}\left(30-13\sqrt{5}\right) & \frac{1}{580}\left(40+\sqrt{5}\right) & \frac{1}{220}\left(30+13\sqrt{5}\right) & \frac{1}{20} & \frac{1}{580}\left(40-\sqrt{5}\right) & \frac{1}{28} \\
\frac{5624}{11\,165} & \frac{1}{220}\left(5-2\sqrt{5}\right) & \frac{1}{116}\left(15+4\sqrt{5}\right) & \frac{1}{220}\left(5+2\sqrt{5}\right) & \frac{3}{20} & \frac{1}{116}\left(15-4\sqrt{5}\right) & \frac{13}{308} \\
\frac{5619}{11\,165} & \frac{3}{220}\left(5-2\sqrt{5}\right) & \frac{3}{580}\left(15+4\sqrt{5}\right) & \frac{3}{220}\left(5+2\sqrt{5}\right) & \frac{3}{20} & \frac{3}{580}\left(15-4\sqrt{5}\right) & \frac{17}{308} \\
\frac{802}{1595} & \frac{1}{44}\left(5-2\sqrt{5}\right) & \frac{1}{580}\left(15+4\sqrt{5}\right) & \frac{1}{44}\left(5+2\sqrt{5}\right) & \frac{3}{20} & \frac{1}{580}\left(15-4\sqrt{5}\right) & \frac{3}{44} \\
\frac{5497}{11\,165} & \frac{1}{440}\left(25-\sqrt{5}\right) & \frac{105-\sqrt{5}}{1160} & \frac{1}{440}\left(25+\sqrt{5}\right) & \frac{1}{5} & \frac{105+\sqrt{5}}{1160} & \frac{1}{77} \\
\frac{5492}{11\,165} & -\frac{9}{440}\left(-5+\sqrt{5}\right) & \frac{45-17\sqrt{5}}{1160} & \frac{9}{440}\left(5+\sqrt{5}\right) & \frac{1}{5} & \frac{45+17\sqrt{5}}{1160} & \frac{2}{77} \\
\frac{784}{1595} & \frac{1}{88}\left(3+\sqrt{5}\right) & \frac{1}{232}\left(11+\sqrt{5}\right) & \frac{1}{88}\left(3-\sqrt{5}\right) & \frac{3}{10} & \frac{1}{232}\left(11-\sqrt{5}\right) & \frac{1}{22} \\
\frac{159}{319} & \frac{1}{440}\left(25-9\sqrt{5}\right) & \frac{225+31\sqrt{5}}{1160} & \frac{1}{440}\left(25+9\sqrt{5}\right) & 0 & \frac{225-31\sqrt{5}}{1160} & 0 \\
\frac{1112}{2233} & \frac{1}{440}\left(45-17\sqrt{5}\right) & \frac{3}{232}\left(11+\sqrt{5}\right) & \frac{1}{440}\left(45+17\sqrt{5}\right) & 0 & -\frac{3}{232}\left(-11+\sqrt{5}\right) & \frac{1}{77} \\
\frac{101}{203} & \frac{1}{88}\left(13-5\sqrt{5}\right) & \frac{105-\sqrt{5}}{1160} & \frac{1}{88}\left(13+5\sqrt{5}\right) & 0 & \frac{105+\sqrt{5}}{1160} & \frac{2}{77} \\
\frac{5556}{11\,165} & -\frac{3}{440}\left(-5+\sqrt{5}\right) & \frac{175+37\sqrt{5}}{1160} & \frac{3}{440}\left(5+\sqrt{5}\right) & \frac{1}{10} & \frac{175-37\sqrt{5}}{1160} & \frac{5}{154} \\
\frac{5546}{11\,165} & \frac{1}{8}-\frac{19}{88\sqrt{5}} & \frac{1}{232}\left(11+\sqrt{5}\right) & \frac{1}{8}+\frac{19}{88\sqrt{5}} & \frac{1}{10} & \frac{1}{232}\left(11-\sqrt{5}\right) & \frac{9}{154} \\
\frac{160}{319} & \frac{1}{440}\left(65-29\sqrt{5}\right) & \frac{65+27\sqrt{5}}{1160} & \frac{1}{440}\left(65+29\sqrt{5}\right) & 0 & \frac{65-27\sqrt{5}}{1160} & \frac{1}{11} \\
\frac{156}{319} & \frac{1}{440}\left(65-19\sqrt{5}\right) & \frac{1}{232}\left(25-3\sqrt{5}\right) & \frac{1}{440}\left(65+19\sqrt{5}\right) & 0 & \frac{1}{232}\left(25+3\sqrt{5}\right) & 0 \\
\frac{5461}{\cdots} & \frac{3}{\cdots}\left(5+\sqrt{5}\right) & \frac{195+23\sqrt{5}}{\cdots} & -\frac{3}{\cdots}\left(-5+\sqrt{5}\right) & \frac{1}{\cdots} & \frac{195-23\sqrt{5}}{\cdots} & \frac{1}{\cdots}
\end{pmatrix}$$

$\frac{11165}{}$	440	1160	440	10	1160	154
$\frac{496}{1015}$	$\frac{1}{88}\left(7-\sqrt{5}\right)$	$\frac{135+7\sqrt{5}}{1160}$	$\frac{1}{88}\left(7+\sqrt{5}\right)$	$\frac{1}{10}$	$\frac{135-7\sqrt{5}}{1160}$	$\frac{3}{154}$
$\frac{5451}{11165}$	$\frac{1}{8}-\frac{13}{88\sqrt{5}}$	$\frac{75-9\sqrt{5}}{1160}$	$\frac{1}{8}+\frac{13}{88\sqrt{5}}$	$\frac{1}{10}$	$\frac{3\left(25+3\sqrt{5}\right)}{1160}$	$\frac{5}{154}$
$\frac{5447}{11165}$	$\frac{1}{440}\left(25+\sqrt{5}\right)$	$\frac{85+13\sqrt{5}}{1160}$	$\frac{1}{440}\left(25-\sqrt{5}\right)$	$\frac{1}{5}$	$\frac{85-13\sqrt{5}}{1160}$	$\frac{4}{77}$
$\frac{5442}{11165}$	$\frac{1}{440}\left(45-7\sqrt{5}\right)$	$\frac{25-3\sqrt{5}}{1160}$	$\frac{1}{440}\left(45+7\sqrt{5}\right)$	$\frac{1}{5}$	$\frac{25+3\sqrt{5}}{1160}$	$\frac{5}{77}$
$\frac{1104}{2233}$	$\frac{1}{440}\left(5+\sqrt{5}\right)$	$\frac{265+61\sqrt{5}}{1160}$	$\frac{1}{440}\left(5-\sqrt{5}\right)$	0	$\frac{265-61\sqrt{5}}{1160}$	$\frac{2}{77}$
$\frac{38}{77}$	$-\frac{3}{88}\left(-3+\sqrt{5}\right)$	$\frac{1}{40}\left(5+\sqrt{5}\right)$	$\frac{3}{88}\left(3+\sqrt{5}\right)$	0	$\frac{1}{40}\left(5-\sqrt{5}\right)$	$\frac{4}{77}$
$\frac{100}{203}$	$\frac{1}{440}\left(85-31\sqrt{5}\right)$	$\frac{25-3\sqrt{5}}{1160}$	$\frac{1}{440}\left(85+31\sqrt{5}\right)$	0	$\frac{25+3\sqrt{5}}{1160}$	$\frac{6}{77}$
$\frac{5501}{11165}$	$\frac{1}{440}\left(35-9\sqrt{5}\right)$	$\frac{1}{232}\left(19+7\sqrt{5}\right)$	$\frac{1}{440}\left(35+9\sqrt{5}\right)$	$\frac{1}{10}$	$\frac{1}{232}\left(19-7\sqrt{5}\right)$	$\frac{13}{154}$
$\frac{1112}{2233}$	$\frac{5}{88}-\frac{1}{8\sqrt{5}}$	$\frac{165+73\sqrt{5}}{1160}$	$\frac{5}{88}+\frac{1}{8\sqrt{5}}$	0	$\frac{165-73\sqrt{5}}{1160}$	$\frac{8}{77}$
$\frac{5359}{11165}$	$\frac{1}{110}\left(5+2\sqrt{5}\right)$	$\frac{1}{290}\left(40+\sqrt{5}\right)$	$\frac{1}{110}\left(5-2\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{290}\left(40-\sqrt{5}\right)$	$\frac{1}{308}$
$\frac{5354}{11165}$	$\frac{1}{11}$	$\frac{1}{290}\left(25-3\sqrt{5}\right)$	$\frac{1}{11}$	$\frac{3}{20}$	$\frac{1}{290}\left(25+3\sqrt{5}\right)$	$\frac{5}{308}$
$\frac{1069}{2233}$	$\frac{3}{220}\left(5+\sqrt{5}\right)$	$\frac{1}{580}\left(25-3\sqrt{5}\right)$	$-\frac{3}{220}\left(-5+\sqrt{5}\right)$	$\frac{1}{4}$	$\frac{1}{580}\left(25+3\sqrt{5}\right)$	$\frac{15}{308}$
$\frac{5413}{11165}$	$\frac{1}{220}\left(15-\sqrt{5}\right)$	$\frac{1}{580}\left(85+13\sqrt{5}\right)$	$\frac{1}{220}\left(15+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(85-13\sqrt{5}\right)$	$\frac{1}{28}$
$\frac{5408}{11165}$	$\frac{1}{44}\left(5-\sqrt{5}\right)$	$\frac{1}{116}\left(11+\sqrt{5}\right)$	$\frac{1}{44}\left(5+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{116}\left(11-\sqrt{5}\right)$	$\frac{15}{308}$
$\frac{5403}{11165}$	$\frac{1}{220}\left(35-9\sqrt{5}\right)$	$\frac{1}{580}\left(25-3\sqrt{5}\right)$	$\frac{1}{220}\left(35+9\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(25+3\sqrt{5}\right)$	$\frac{19}{308}$
$\frac{772}{1595}$	$\frac{1}{110}\left(5+\sqrt{5}\right)$	$\frac{1}{145}\left(15+4\sqrt{5}\right)$	$\frac{1}{110}\left(5-\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{145}\left(15-4\sqrt{5}\right)$	$\frac{3}{44}$
$\frac{5399}{11165}$	$\frac{1}{110}\left(10-\sqrt{5}\right)$	$\frac{1}{290}\left(15+4\sqrt{5}\right)$	$\frac{1}{110}\left(10+\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{290}\left(15-4\sqrt{5}\right)$	$\frac{25}{308}$
$\frac{186}{385}$	$-\frac{3}{110}\left(-5+\sqrt{5}\right)$	0	$\frac{3}{110}\left(5+\sqrt{5}\right)$	$\frac{3}{20}$	0	$\frac{29}{308}$
$\frac{5463}{11165}$	$\frac{1}{220}\left(5+\sqrt{5}\right)$	$\frac{1}{116}\left(19+7\sqrt{5}\right)$	$\frac{1}{220}\left(5-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{116}\left(19-7\sqrt{5}\right)$	$\frac{27}{308}$
$\frac{5458}{11165}$	$-\frac{3}{220}\left(-5+\sqrt{5}\right)$	$\frac{1}{580}\left(65+27\sqrt{5}\right)$	$\frac{3}{220}\left(5+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(65-27\sqrt{5}\right)$	$\frac{31}{308}$
$\frac{5284}{11165}$	$\frac{1}{220}\left(15+4\sqrt{5}\right)$	$\frac{1}{580}\left(65-2\sqrt{5}\right)$	$\frac{1}{220}\left(15-4\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{580}\left(65+2\sqrt{5}\right)$	$\frac{5}{308}$
$\frac{5279}{11165}$	$\frac{5}{44}$	$\frac{1}{116}\left(7-2\sqrt{5}\right)$	$\frac{5}{44}$	$\frac{3}{20}$	$\frac{1}{116}\left(7+2\sqrt{5}\right)$	$\frac{9}{308}$
$\frac{5343}{11165}$	$\frac{1}{220}\left(10+3\sqrt{5}\right)$	$\frac{1}{580}\left(100+17\sqrt{5}\right)$	$\frac{1}{220}\left(10-3\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(100-17\sqrt{5}\right)$	$\frac{1}{28}$
$\frac{5338}{11165}$	$\frac{1}{220}\left(20-\sqrt{5}\right)$	$\frac{1}{580}\left(70+9\sqrt{5}\right)$	$\frac{1}{220}\left(20+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(70-9\sqrt{5}\right)$	$\frac{15}{308}$
$\frac{5333}{11165}$	$\frac{1}{44}\left(6-\sqrt{5}\right)$	$\frac{1}{580}\left(40+\sqrt{5}\right)$	$\frac{1}{44}\left(6+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(40-\sqrt{5}\right)$	$\frac{19}{308}$
$\frac{5329}{11165}$	$\frac{1}{220}\left(15+2\sqrt{5}\right)$	$\frac{3}{580}\left(15+4\sqrt{5}\right)$	$\frac{1}{220}\left(15-2\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{3}{580}\left(15-4\sqrt{5}\right)$	$\frac{25}{308}$
$\frac{484}{1015}$	$\frac{1}{220}\left(25-2\sqrt{5}\right)$	$\frac{1}{580}\left(15+4\sqrt{5}\right)$	$\frac{1}{220}\left(25+2\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{580}\left(15-4\sqrt{5}\right)$	$\frac{29}{308}$
$\frac{5388}{11165}$	$\frac{1}{220}\left(10+\sqrt{5}\right)$	$\frac{1}{580}\left(80+31\sqrt{5}\right)$	$\frac{1}{220}\left(10-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(80-31\sqrt{5}\right)$	$\frac{31}{308}$
$\frac{5216}{11165}$	$\frac{1}{440}\left(35+9\sqrt{5}\right)$	$\frac{155-7\sqrt{5}}{1160}$	$\frac{1}{440}\left(35-9\sqrt{5}\right)$	$\frac{1}{10}$	$\frac{155+7\sqrt{5}}{1160}$	$\frac{1}{154}$
$\frac{5211}{11165}$	$\frac{1}{440}\left(55+\sqrt{5}\right)$	$\frac{95-23\sqrt{5}}{1160}$	$\frac{1}{8}-\frac{1}{88\sqrt{5}}$	$\frac{1}{10}$	$\frac{95+23\sqrt{5}}{1160}$	$\frac{3}{154}$
$\frac{5202}{11165}$	$\frac{1}{440}\left(45+7\sqrt{5}\right)$	$\frac{45-17\sqrt{5}}{1160}$	$\frac{1}{440}\left(45-7\sqrt{5}\right)$	$\frac{1}{5}$	$\frac{45+17\sqrt{5}}{1160}$	$\frac{4}{77}$
$\frac{1055}{2233}$	$\frac{1}{440}\left(25+7\sqrt{5}\right)$	$\frac{225+31\sqrt{5}}{1160}$	$\frac{1}{440}\left(25-7\sqrt{5}\right)$	0	$\frac{225-31\sqrt{5}}{1160}$	$\frac{2}{77}$
$\frac{1054}{2233}$	$\frac{1}{440}\left(45-\sqrt{5}\right)$	$\frac{3}{232}\left(11+\sqrt{5}\right)$	$\frac{1}{440}\left(45+\sqrt{5}\right)$	0	$-\frac{3}{232}\left(-11+\sqrt{5}\right)$	$\frac{3}{77}$
$\frac{1053}{2233}$	$\frac{1}{440}\left(65-9\sqrt{5}\right)$	$\frac{105-\sqrt{5}}{1160}$	$\frac{1}{440}\left(65+9\sqrt{5}\right)$	0	$\frac{105+\sqrt{5}}{1160}$	$\frac{4}{77}$
$\frac{1052}{2233}$	$-\frac{17}{440}\left(-5+\sqrt{5}\right)$	$\frac{45-17\sqrt{5}}{1160}$	$\frac{17}{440}\left(5+\sqrt{5}\right)$	0	$\frac{45+17\sqrt{5}}{1160}$	$\frac{5}{77}$
$\frac{5261}{11165}$	$\frac{1}{88}\left(7+\sqrt{5}\right)$	$\frac{115+21\sqrt{5}}{1160}$	$\frac{1}{88}\left(7-\sqrt{5}\right)$	$\frac{1}{10}$	$\frac{115-21\sqrt{5}}{1160}$	$\frac{1}{14}$

$\frac{11\,165}{}$	$\frac{88}{}$	$\frac{1160}{}$	$\frac{88}{}$	$\frac{10}{}$	$\frac{1160}{}$	$\frac{14}{}$
$\frac{5256}{11\,165}$	$\frac{1}{8}-\frac{3}{88\sqrt{5}}$	$\frac{1}{232}\left(11+\sqrt{5}\right)$	$\frac{1}{8}+\frac{3}{88\sqrt{5}}$	$\frac{1}{10}$	$\frac{1}{232}\left(11-\sqrt{5}\right)$	$\frac{13}{154}$
$\frac{5252}{11\,165}$	$\frac{5}{88}+\frac{1}{8\sqrt{5}}$	$\frac{65+27\sqrt{5}}{1160}$	$\frac{5}{88}-\frac{1}{8\sqrt{5}}$	$\frac{1}{5}$	$\frac{65-27\sqrt{5}}{1160}$	$\frac{8}{77}$
$\frac{152}{319}$	$\frac{1}{440}\left(25+3\sqrt{5}\right)$	$\frac{185+59\sqrt{5}}{1160}$	$\frac{1}{440}\left(25-3\sqrt{5}\right)$	0	$\frac{185-59\sqrt{5}}{1160}$	$\frac{1}{11}$
$\frac{1063}{2233}$	$\frac{1}{88}\left(9-\sqrt{5}\right)$	$\frac{125+43\sqrt{5}}{1160}$	$\frac{1}{88}\left(9+\sqrt{5}\right)$	0	$\frac{125-43\sqrt{5}}{1160}$	$\frac{8}{77}$
$\frac{1062}{2233}$	$-\frac{13}{440}\left(-5+\sqrt{5}\right)$	$\frac{65+27\sqrt{5}}{1160}$	$\frac{13}{440}\left(5+\sqrt{5}\right)$	0	$\frac{65-27\sqrt{5}}{1160}$	$\frac{9}{77}$
$\frac{1035}{2233}$	$\frac{1}{88}\left(9+\sqrt{5}\right)$	$\frac{185+\sqrt{5}}{1160}$	$\frac{1}{88}\left(9-\sqrt{5}\right)$	0	$\frac{185-\sqrt{5}}{1160}$	$\frac{1}{77}$
$\frac{94}{203}$	$\frac{1}{440}\left(65-3\sqrt{5}\right)$	$\frac{1}{232}\left(25-3\sqrt{5}\right)$	$\frac{1}{440}\left(65+3\sqrt{5}\right)$	0	$\frac{1}{232}\left(25+3\sqrt{5}\right)$	$\frac{2}{77}$
$\frac{738}{1595}$	$\frac{7}{88}+\frac{1}{8\sqrt{5}}$	$\frac{135+7\sqrt{5}}{1160}$	$\frac{7}{88}-\frac{1}{8\sqrt{5}}$	$\frac{1}{10}$	$\frac{135-7\sqrt{5}}{1160}$	$\frac{1}{22}$
$\frac{5161}{11\,165}$	$\frac{1}{8}+\frac{3}{88\sqrt{5}}$	$\frac{75-9\sqrt{5}}{1160}$	$\frac{1}{8}-\frac{3}{88\sqrt{5}}$	$\frac{1}{10}$	$\frac{3\left(25+3\sqrt{5}\right)}{1160}$	$\frac{9}{154}$
$\frac{736}{1595}$	$\frac{9}{440}\left(5+\sqrt{5}\right)$	$\frac{25-3\sqrt{5}}{1160}$	$-\frac{9}{440}\left(-5+\sqrt{5}\right)$	$\frac{1}{5}$	$\frac{25+3\sqrt{5}}{1160}$	$\frac{1}{11}$
$\frac{95}{203}$	$\frac{1}{440}\left(25+9\sqrt{5}\right)$	$\frac{1}{232}\left(41+9\sqrt{5}\right)$	$\frac{1}{440}\left(25-9\sqrt{5}\right)$	0	$\frac{1}{232}\left(41-9\sqrt{5}\right)$	$\frac{5}{77}$
$\frac{36}{77}$	$\frac{1}{440}\left(45+\sqrt{5}\right)$	$\frac{1}{40}\left(5+\sqrt{5}\right)$	$\frac{1}{440}\left(45-\sqrt{5}\right)$	0	$\frac{1}{40}\left(5-\sqrt{5}\right)$	$\frac{6}{77}$
$\frac{149}{319}$	$\frac{1}{440}\left(65-7\sqrt{5}\right)$	$\frac{85+13\sqrt{5}}{1160}$	$\frac{1}{440}\left(65+7\sqrt{5}\right)$	0	$\frac{85-13\sqrt{5}}{1160}$	$\frac{1}{11}$
$\frac{1042}{2233}$	$\frac{1}{88}\left(17-3\sqrt{5}\right)$	$\frac{25-3\sqrt{5}}{1160}$	$\frac{1}{88}\left(17+3\sqrt{5}\right)$	0	$\frac{25+3\sqrt{5}}{1160}$	$\frac{8}{77}$
$\frac{5211}{11\,165}$	$\frac{7}{440}\left(5+\sqrt{5}\right)$	$\frac{1}{232}\left(19+7\sqrt{5}\right)$	$-\frac{7}{440}\left(-5+\sqrt{5}\right)$	$\frac{1}{10}$	$\frac{1}{232}\left(19-7\sqrt{5}\right)$	$\frac{17}{154}$
$\frac{1054}{2233}$	$\frac{1}{88}\left(5+\sqrt{5}\right)$	$\frac{165+73\sqrt{5}}{1160}$	$\frac{1}{88}\left(5-\sqrt{5}\right)$	0	$\frac{165-73\sqrt{5}}{1160}$	$\frac{10}{77}$
$\frac{5073}{11\,165}$	$\frac{1}{44}\left(5+\sqrt{5}\right)$	$\frac{1}{580}\left(75-9\sqrt{5}\right)$	$\frac{1}{44}\left(5-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{3}{580}\left(25+3\sqrt{5}\right)$	$\frac{3}{308}$
$\frac{724}{1595}$	$\frac{1}{220}\left(35+\sqrt{5}\right)$	$\frac{1}{580}\left(45-17\sqrt{5}\right)$	$\frac{1}{220}\left(35-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(45+17\sqrt{5}\right)$	$\frac{1}{44}$
$\frac{5064}{11\,165}$	$\frac{1}{55}\left(5+2\sqrt{5}\right)$	$\frac{1}{290}\left(25-3\sqrt{5}\right)$	$\frac{1}{55}\left(5-2\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{290}\left(25+3\sqrt{5}\right)$	$\frac{13}{308}$
$\frac{5118}{11\,165}$	$\frac{1}{220}\left(25+3\sqrt{5}\right)$	$\frac{1}{116}\left(11+\sqrt{5}\right)$	$\frac{1}{220}\left(25-3\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{116}\left(11-\sqrt{5}\right)$	$\frac{23}{308}$
$\frac{5113}{11\,165}$	$\frac{1}{220}\left(35-\sqrt{5}\right)$	$\frac{1}{580}\left(25-3\sqrt{5}\right)$	$\frac{1}{220}\left(35+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(25+3\sqrt{5}\right)$	$\frac{27}{308}$
$\frac{5109}{11\,165}$	$\frac{1}{110}\left(10+3\sqrt{5}\right)$	$\frac{1}{290}\left(15+4\sqrt{5}\right)$	$\frac{1}{110}\left(10-3\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{290}\left(15-4\sqrt{5}\right)$	$\frac{3}{28}$
$\frac{16}{35}$	$\frac{1}{110}\left(15+\sqrt{5}\right)$	0	$\frac{1}{110}\left(15-\sqrt{5}\right)$	$\frac{3}{20}$	0	$\frac{37}{308}$
$\frac{5168}{11\,165}$	$\frac{1}{44}\left(3+\sqrt{5}\right)$	$\frac{1}{580}\left(65+27\sqrt{5}\right)$	$\frac{1}{44}\left(3-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(65-27\sqrt{5}\right)$	$\frac{39}{308}$
$\frac{714}{1595}$	$\frac{1}{44}\left(6+\sqrt{5}\right)$	$\frac{1}{580}\left(60-13\sqrt{5}\right)$	$\frac{1}{44}\left(6-\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(60+13\sqrt{5}\right)$	$\frac{1}{44}$
$\frac{4989}{11\,165}$	$\frac{1}{220}\left(25+8\sqrt{5}\right)$	$\frac{1}{116}\left(7-2\sqrt{5}\right)$	$\frac{1}{220}\left(25-8\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{116}\left(7+2\sqrt{5}\right)$	$\frac{17}{308}$
$\frac{5048}{11\,165}$	$\frac{1}{220}\left(20+7\sqrt{5}\right)$	$\frac{1}{580}\left(70+9\sqrt{5}\right)$	$\frac{1}{220}\left(20-7\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(70-9\sqrt{5}\right)$	$\frac{23}{308}$
$\frac{5043}{11\,165}$	$\frac{3}{220}\left(10+\sqrt{5}\right)$	$\frac{1}{580}\left(40+\sqrt{5}\right)$	$-\frac{3}{220}\left(-10+\sqrt{5}\right)$	$\frac{1}{20}$	$\frac{1}{580}\left(40-\sqrt{5}\right)$	$\frac{27}{308}$
$\frac{5034}{11\,165}$	$\frac{1}{220}\left(25+6\sqrt{5}\right)$	$\frac{1}{580}\left(15+4\sqrt{5}\right)$	$\frac{1}{220}\left(25-6\sqrt{5}\right)$	$\frac{3}{20}$	$\frac{1}{580}\left(15-4\sqrt{5}\right)$	$\frac{37}{308}$
$\frac{141}{319}$	$\frac{1}{440}\left(45+19\sqrt{5}\right)$	$\frac{205-13\sqrt{5}}{1160}$	$\frac{1}{440}\left(45-19\sqrt{5}\right)$	0	$\frac{205+13\sqrt{5}}{1160}$	0
$\frac{34}{77}$	$\frac{13}{88}+\frac{1}{8\sqrt{5}}$	$\frac{1}{40}\left(5-\sqrt{5}\right)$	$\frac{13}{88}-\frac{1}{8\sqrt{5}}$	0	$\frac{1}{40}\left(5+\sqrt{5}\right)$	$\frac{1}{77}$
$\frac{996}{2233}$	$\frac{3}{88}\left(3+\sqrt{5}\right)$	$\frac{3}{232}\left(11+\sqrt{5}\right)$	$-\frac{3}{88}\left(-3+\sqrt{5}\right)$	0	$-\frac{3}{232}\left(-11+\sqrt{5}\right)$	$\frac{5}{77}$
$\frac{995}{2233}$	$\frac{1}{440}\left(65+7\sqrt{5}\right)$	$\frac{105-\sqrt{5}}{1160}$	$\frac{1}{440}\left(65-7\sqrt{5}\right)$	0	$\frac{105+\sqrt{5}}{1160}$	$\frac{6}{77}$
$\frac{142}{319}$	$\frac{1}{440}\left(85-\sqrt{5}\right)$	$\frac{45-17\sqrt{5}}{1160}$	$\frac{1}{440}\left(85+\sqrt{5}\right)$	0	$\frac{45+17\sqrt{5}}{1160}$	$\frac{1}{11}$
$\frac{4966}{11\,165}$	$\frac{1}{8}+\frac{13}{88\sqrt{5}}$	$\frac{1}{232}\left(11+\sqrt{5}\right)$	$\frac{1}{8}-\frac{13}{88\sqrt{5}}$	$\frac{1}{10}$	$\frac{1}{232}\left(11-\sqrt{5}\right)$	$\frac{17}{154}$
$\frac{1005}{}$	9 1	$125+43\sqrt{5}$	9 1	0	$125-43\sqrt{5}$	10

$$\begin{pmatrix}
\frac{}{2233} & \frac{}{88}+\frac{}{8\sqrt{5}} & \frac{}{1160} & \frac{}{88}-\frac{}{8\sqrt{5}} & 0 & \frac{}{1160} & \frac{}{77} \\
\frac{1004}{2233} & \frac{1}{440}\left(65+3\sqrt{5}\right) & \frac{65+27\sqrt{5}}{1160} & \frac{1}{440}\left(65-3\sqrt{5}\right) & 0 & \frac{65-27\sqrt{5}}{1160} & \frac{1}{7} \\
\frac{4826}{11\,165} & \frac{1}{8}+\frac{23}{88\sqrt{5}} & \frac{115-37\sqrt{5}}{1160} & \frac{1}{8}-\frac{23}{88\sqrt{5}} & \frac{1}{10} & \frac{115+37\sqrt{5}}{1160} & \frac{3}{154} \\
\frac{976}{2233} & \frac{13}{440}\left(5+\sqrt{5}\right) & \frac{1}{232}\left(25-3\sqrt{5}\right) & -\frac{13}{440}\left(-5+\sqrt{5}\right) & 0 & \frac{1}{232}\left(25+3\sqrt{5}\right) & \frac{4}{77} \\
\frac{4871}{11\,165} & \frac{1}{8}+\frac{19}{88\sqrt{5}} & \frac{75-9\sqrt{5}}{1160} & \frac{1}{8}-\frac{19}{88\sqrt{5}} & \frac{1}{10} & \frac{3\left(25+3\sqrt{5}\right)}{1160} & \frac{13}{154} \\
\frac{34}{77} & \frac{1}{440}\left(45+17\sqrt{5}\right) & \frac{1}{40}\left(5+\sqrt{5}\right) & \frac{1}{440}\left(45-17\sqrt{5}\right) & 0 & \frac{1}{40}\left(5-\sqrt{5}\right) & \frac{8}{77} \\
\frac{985}{2233} & \frac{1}{440}\left(65+9\sqrt{5}\right) & \frac{85+13\sqrt{5}}{1160} & \frac{1}{440}\left(65-9\sqrt{5}\right) & 0 & \frac{85-13\sqrt{5}}{1160} & \frac{9}{77} \\
\frac{984}{2233} & \frac{1}{440}\left(85+\sqrt{5}\right) & \frac{25-3\sqrt{5}}{1160} & \frac{1}{440}\left(85-\sqrt{5}\right) & 0 & \frac{25+3\sqrt{5}}{1160} & \frac{10}{77} \\
\frac{4778}{11\,165} & \frac{1}{220}\left(35+9\sqrt{5}\right) & \frac{1}{580}\left(45-17\sqrt{5}\right) & \frac{1}{220}\left(35-9\sqrt{5}\right) & \frac{1}{20} & \frac{1}{580}\left(45+17\sqrt{5}\right) & \frac{15}{308} \\
\frac{4828}{11\,165} & \frac{5}{44}+\frac{1}{4\sqrt{5}} & \frac{1}{116}\left(11+\sqrt{5}\right) & \frac{5}{44}-\frac{1}{4\sqrt{5}} & \frac{1}{20} & \frac{1}{116}\left(11-\sqrt{5}\right) & \frac{31}{308} \\
\frac{689}{1595} & \frac{7}{220}\left(5+\sqrt{5}\right) & \frac{1}{580}\left(25-3\sqrt{5}\right) & -\frac{7}{220}\left(-5+\sqrt{5}\right) & \frac{1}{20} & \frac{1}{580}\left(25+3\sqrt{5}\right) & \frac{5}{44} \\
\frac{166}{385} & \frac{1}{22}\left(3+\sqrt{5}\right) & 0 & \frac{1}{22}\left(3-\sqrt{5}\right) & \frac{3}{20} & 0 & \frac{45}{308} \\
\frac{428}{1015} & \frac{1}{220}\left(30+13\sqrt{5}\right) & \frac{1}{580}\left(60-13\sqrt{5}\right) & \frac{1}{220}\left(30-13\sqrt{5}\right) & \frac{1}{20} & \frac{1}{580}\left(60+13\sqrt{5}\right) & \frac{15}{308} \\
\frac{679}{1595} & \frac{3}{22}+\frac{1}{4\sqrt{5}} & \frac{1}{580}\left(40+\sqrt{5}\right) & \frac{3}{22}-\frac{1}{4\sqrt{5}} & \frac{1}{20} & \frac{1}{580}\left(40-\sqrt{5}\right) & \frac{5}{44} \\
\frac{32}{77} & \frac{1}{440}\left(65+27\sqrt{5}\right) & \frac{1}{40}\left(5-\sqrt{5}\right) & \frac{1}{440}\left(65-27\sqrt{5}\right) & 0 & \frac{1}{40}\left(5+\sqrt{5}\right) & \frac{3}{77} \\
\frac{937}{2233} & \frac{1}{440}\left(65+23\sqrt{5}\right) & \frac{105-\sqrt{5}}{1160} & \frac{1}{440}\left(65-23\sqrt{5}\right) & 0 & \frac{105+\sqrt{5}}{1160} & \frac{8}{77} \\
\frac{936}{2233} & \frac{1}{88}\left(17+3\sqrt{5}\right) & \frac{45-17\sqrt{5}}{1160} & \frac{1}{88}\left(17-3\sqrt{5}\right) & 0 & \frac{45+17\sqrt{5}}{1160} & \frac{9}{77} \\
\frac{86}{203} & \frac{1}{440}\left(65+19\sqrt{5}\right) & \frac{65+27\sqrt{5}}{1160} & \frac{1}{440}\left(65-19\sqrt{5}\right) & 0 & \frac{65-27\sqrt{5}}{1160} & \frac{13}{77} \\
\frac{918}{2233} & \frac{1}{440}\left(65+29\sqrt{5}\right) & \frac{1}{232}\left(25-3\sqrt{5}\right) & \frac{1}{440}\left(65-29\sqrt{5}\right) & 0 & \frac{1}{232}\left(25+3\sqrt{5}\right) & \frac{6}{77} \\
\frac{927}{2233} & \frac{1}{88}\left(13+5\sqrt{5}\right) & \frac{85+13\sqrt{5}}{1160} & \frac{1}{88}\left(13-5\sqrt{5}\right) & 0 & \frac{85-13\sqrt{5}}{1160} & \frac{1}{7} \\
\frac{926}{2233} & \frac{17}{440}\left(5+\sqrt{5}\right) & \frac{25-3\sqrt{5}}{1160} & -\frac{17}{440}\left(-5+\sqrt{5}\right) & 0 & \frac{25+3\sqrt{5}}{1160} & \frac{12}{77} \\
\frac{4533}{11\,165} & \frac{1}{44}\left(7+3\sqrt{5}\right) & \frac{1}{580}\left(25-3\sqrt{5}\right) & \frac{1}{44}\left(7-3\sqrt{5}\right) & \frac{1}{20} & \frac{1}{580}\left(25+3\sqrt{5}\right) & \frac{43}{308} \\
\frac{878}{2233} & \frac{1}{440}\left(85+31\sqrt{5}\right) & \frac{45-17\sqrt{5}}{1160} & \frac{1}{440}\left(85-31\sqrt{5}\right) & 0 & \frac{45+17\sqrt{5}}{1160} & \frac{1}{7} \\
\frac{124}{319} & \frac{17}{88}+\frac{3}{8\sqrt{5}} & \frac{25-3\sqrt{5}}{1160} & \frac{17}{88}-\frac{3}{8\sqrt{5}} & 0 & \frac{25+3\sqrt{5}}{1160} & \frac{2}{11}
\end{pmatrix}$$

```
orderedroots[minipoly[chisub]]
```

$$\left\{-5,\ 2-\sqrt{5},\ 6-\sqrt{5},\ 2+\sqrt{5},\ 5,\ 6+\sqrt{5},\ 9\right\}$$

```
orderedroots[(x - 9) (x^2 - 4 x - 1) (x^2 - 12 x + 31)]
```

$$\left\{2-\sqrt{5},\ 6-\sqrt{5},\ 2+\sqrt{5},\ 6+\sqrt{5},\ 9\right\}$$

```
combinationsminpoly = {};
```

```
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
```

```
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] +
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
```

```
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] +
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
```

```
For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] +
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] +
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]

For[i = 1, i ≤ Length[listmod128], i++,
 AppendTo[combinationsminpoly, MinimalPolynomial[
   -4 (4 + √5) * Sqrt[anglesquaredsub[[8, 2]]] * Sqrt[anglesquaredsub[[i, 2]]] -
    4 (4 - 3 √5) * Sqrt[anglesquaredsub[[8, 3]]] * Sqrt[anglesquaredsub[[i, 3]]] -
    4 (4 - √5) * Sqrt[anglesquaredsub[[8, 4]]] * Sqrt[anglesquaredsub[[i, 4]]] -
    4 (4 + 3 √5) * Sqrt[anglesquaredsub[[8, 6]]] * Sqrt[anglesquaredsub[[i, 6]]] -
    56 * Sqrt[anglesquaredsub[[8, 7]]] * Sqrt[anglesquaredsub[[i, 7]]], x]]
]
```

```
Length[combinationsminpoly]
```

1984

```
integercombination = {};
For[i = 1, i ≤ Length[combinationsminpoly], i++,
 If[combinationsminpoly[[i]] - x ∈ Integers, AppendTo[integercombination, i]]]
integercombination
```

{286, 392, 504, 687, 772, 896, 1030, 1136, 1516, 1640, 1744, 1927}

```
Mod[integercombination, 124]
```

{38, 20, 8, 67, 28, 28, 38, 20, 28, 28, 8, 67}

```
integercombination = Sort[DeleteDuplicates[Mod[integercombination, 124]]]
```

{8, 20, 28, 38, 67}

```
refinedlistsub = listmod128[[integercombination]]
```

$$\{-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6,$$
$$-1742+1239\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6,$$
$$(-9+x)\,(-5+x)\,(-1+x)\,\left(34+15\,x-10\,x^2+x^3\right),$$
$$(-5+x)\,\left(-1-8\,x+x^2\right)\,\left(14+29\,x-12\,x^2+x^3\right),$$
$$\left(-58+55\,x-14\,x^2+x^3\right)\,\left(59+15\,x-11\,x^2+x^3\right)\}$$

```
refinedlistsub * mu[chisub] // Factor
```

$$\{(-5+x)^8\,(5+x)^{13}\,\left(-554+387\,x+1065\,x^2-842\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-5+x)^8\,(5+x)^{13}\,\left(-1742+1239\,x+877\,x^2-830\,x^3+224\,x^4-25\,x^5+x^6\right),$$
$$(-9+x)\,(-5+x)^9\,(-1+x)\,(5+x)^{13}\,\left(34+15\,x-10\,x^2+x^3\right),$$
$$(-5+x)^9\,(5+x)^{13}\,\left(-1-8\,x+x^2\right)\,\left(14+29\,x-12\,x^2+x^3\right),$$
$$(-5+x)^8\,(5+x)^{13}\,\left(-58+55\,x-14\,x^2+x^3\right)\,\left(59+15\,x-11\,x^2+x^3\right)\}$$

```
refinedAsub = CoefficientList[refinedlistsub, x]
```

{{-554, 387, 1065, -842, 224, -25, 1},
 {-1742, 1239, 877, -830, 224, -25, 1}, {-1530, 1331, 825, -826, 224, -25, 1},
 {70, 691, 889, -826, 224, -25, 1}, {-3422, 2375, 637, -814, 224, -25, 1}}

```
refinedAsub // MatrixForm
```

$$\begin{pmatrix} -554 & 387 & 1065 & -842 & 224 & -25 & 1 \\ -1742 & 1239 & 877 & -830 & 224 & -25 & 1 \\ -1530 & 1331 & 825 & -826 & 224 & -25 & 1 \\ 70 & 691 & 889 & -826 & 224 & -25 & 1 \\ -3422 & 2375 & 637 & -814 & 224 & -25 & 1 \end{pmatrix}$$

```
Solve[Array[n, 5].refinedAsub == gsub, Array[n, 5]]
```

$$\left\{\left\{n[1] \to \frac{39}{2},\ n[2] \to 2,\ n[3] \to \frac{9}{4},\ n[4] \to \frac{1}{4},\ n[5] \to 4\right\}\right\}$$

```
chi = (-9 + x)^2 (-5 + x)^10 (-4 + x) (-3 + x) (5 + x)^15
```

$$(-9+x)^2\,(-5+x)^{10}\,(-4+x)\,(-3+x)\,(5+x)^{15}$$

```
feasibleinterlacingpolylist[chi]
```

$$\left\{\left(31-12\,x+x^2\right)\left(-1-4\,x+x^2\right),\ (-5+x)\,(-3+x)\left(-1-8\,x+x^2\right),\right.$$
$$(-3+x)\left(-11+39\,x-13\,x^2+x^3\right),\ (-3+x)\left(-3+39\,x-13\,x^2+x^3\right),$$
$$\left.(-5+x)\left(11+23\,x-11\,x^2+x^3\right),\ (-5+x)\left(19+23\,x-11\,x^2+x^3\right)\right\}$$

```
reducedlist = {(-5 + x) (-3 + x) (-1 - 8 x + x^2),
   (-3 + x) (-11 + 39 x - 13 x^2 + x^3), (-3 + x) (-3 + 39 x - 13 x^2 + x^3),
   (-5 + x) (11 + 23 x - 11 x^2 + x^3), (-5 + x) (19 + 23 x - 11 x^2 + x^3)}
```

$$\left\{(-5+x)\,(-3+x)\left(-1-8\,x+x^2\right),\right.$$
$$(-3+x)\left(-11+39\,x-13\,x^2+x^3\right),\ (-3+x)\left(-3+39\,x-13\,x^2+x^3\right),$$
$$\left.(-5+x)\left(11+23\,x-11\,x^2+x^3\right),\ (-5+x)\left(19+23\,x-11\,x^2+x^3\right)\right\}$$

```
reducedA = CoefficientList[reducedlist, x]
```

$$\{\{-15,-112,78,-16,1\},\{33,-128,78,-16,1\},$$
$$\{9,-120,78,-16,1\},\{-55,-104,78,-16,1\},\{-95,-96,78,-16,1\}\}$$

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

$$\{525,-3600,2262,-464,29\}$$

```
allsoln = Array[n, 5] /. Solve[n[1] ≥ 0 && n[2] ≥ 0 && n[3] ≥ 0 &&
     n[4] ≥ 0 && n[5] ≥ 0 && Array[n, 5].reducedA == g, Array[n, 5], Integers]
```

$$\{\{0,24,2,0,3\},\{0,25,0,2,2\},\{1,25,0,0,3\}\}$$

```
anglesquared = anglesquaredmat[chi, reducedlist] // FullSimplify;
```

```
anglesquared // MatrixForm
```

$$\begin{pmatrix} \frac{32}{63} & 0 & \frac{17}{45} & 0 & \frac{4}{35} \\ \frac{164}{315} & 0 & \frac{1}{45} & \frac{2}{5} & \frac{2}{35} \\ \frac{18}{35} & 0 & \frac{1}{5} & \frac{1}{5} & \frac{3}{35} \\ \frac{1}{2} & \frac{1}{6} & \frac{1}{5} & 0 & \frac{2}{15} \\ \frac{31}{63} & \frac{1}{3} & \frac{1}{45} & 0 & \frac{16}{105} \end{pmatrix}$$

```
chi
```

$$(-9+x)^2\,(-5+x)^{10}\,(-4+x)\,(-3+x)\,(5+x)^{15}$$

```
(-9 + x) (-5 + x) (5 + x) /. x → 3
```

```
96
```

```
(-9 + x) (-5 + x) (5 + x) /. x → 4
```

```
45
```

$$v = \begin{pmatrix} \texttt{Sqrt}\left[\frac{1}{45}\right] \\ \texttt{Sqrt}\left[\frac{1}{5}\right] \\ \texttt{Sqrt}\left[\frac{1}{5}\right] \\ \texttt{Sqrt}\left[\frac{1}{45}\right] \\ \texttt{Sqrt}\left[\frac{1}{45}\right] \\ \texttt{Sqrt}\left[\frac{1}{45}\right] \end{pmatrix}; u = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ -\texttt{Sqrt}\left[\frac{1}{3}\right] \\ -\texttt{Sqrt}\left[\frac{1}{3}\right] \\ \texttt{Sqrt}\left[\frac{1}{3}\right] \end{pmatrix};$$

```
Total[u * u]
```

```
{1}
```

```
Total[v * v]
```

```
{1}
```

```
Total[u * v]
```

$$\left\{-\frac{1}{3\sqrt{15}}\right\}$$

$$v = \begin{pmatrix} \mathrm{Sqrt}\left[\frac{17}{45}\right] \\ \mathrm{Sqrt}\left[\frac{1}{45}\right] \end{pmatrix}; \; u = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ -\mathrm{Sqrt}\left[\frac{1}{3}\right] \\ -\mathrm{Sqrt}\left[\frac{1}{3}\right] \\ -\mathrm{Sqrt}\left[\frac{1}{3}\right] \end{pmatrix};$$

```
Total[u * u]
```

```
{1}
```

```
Total[v * v]
```

```
{1}
```

Total[u * v]

$$\left\{-\frac{1}{\sqrt{15}}\right\}$$

$$v = \begin{pmatrix} \text{Sqrt}\left[\frac{1}{45}\right] \\ \text{Sqrt}\left[\frac{1}{5}\right] \\ \text{Sqrt}\left[\frac{1}{5}\right] \\ \text{Sqrt}\left[\frac{1}{45}\right] \\ \text{Sqrt}\left[\frac{1}{45}\right] \end{pmatrix}; \; u = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \text{Sqrt}\left[\frac{1}{6}\right] \\ -\text{Sqrt}\left[\frac{1}{6}\right] \\ \text{Sqrt}\left[\frac{1}{3}\right] \\ -\text{Sqrt}\left[\frac{1}{3}\right] \end{pmatrix};$$

```
Total[u * u]
```

```
{1}
```

```
Total[v * v]
```

```
{1}
```

```
Total[u * v]
```

```
{0}
```

```
96 u.Transpose[u] + 45 v.Transpose[v] // MatrixForm
```

```
⎛1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1      3          3           1
 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3      25        -7         3 + 16 ^
 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3      -7         25         3 - 16 ^
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  3 + 16 √2  3 - 16 √2      33
⎝1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  3 - 16 √2  3 + 16 √2     -31
```

$$v = \begin{pmatrix} \text{Sqrt}\left[\frac{1}{45}\right] \\ \text{Sqrt}\left[\frac{1}{5}\right] \\ \text{Sqrt}\left[\frac{1}{5}\right] \\ \text{Sqrt}\left[\frac{1}{45}\right] \\ \text{Sqrt}\left[\frac{1}{45}\right] \end{pmatrix}; u = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \text{Sqrt}\left[\frac{1}{6}\right] \\ -\text{Sqrt}\left[\frac{1}{6}\right] \\ -\text{Sqrt}\left[\frac{1}{3}\right] \\ \text{Sqrt}\left[\frac{1}{3}\right] \end{pmatrix};$$

```
Total[u * u]
```

```
{1}
```

```
Total[v * v]
```

```
{1}
```

```
Total[u * v]
```

```
{0}
```

```
96 u.Transpose[u] + 45 v.Transpose[v] // MatrixForm
```

```
⎛1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1     3          3          1
 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3    25         -7      3 - 16
 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3    -7         25      3 + 16
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 3 - 16 √2  3 + 16 √2      33
⎝1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 3 + 16 √2  3 - 16 √2     -31
```