A Collection of Numerical Solutions of Multigrade Equations Related to the Prouhet-Tarry-Escott Problem

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Upgrade 14 of Version 12, January 4, 2010

This Upgrade should be used together with Version 12

Solution code	Right terms	Left terms
8.12.473	473, 384, 348, 229, 175, 81	471, 400, 319, 252, 177, 59
8.12.544	544, 471, 355, 163, 156, 47	541, 481, 327, 240, 68, 61
8.12.557	557, 502, 458, 308, 233, 57	543, 532, 433, 317, 242, 2
8.12.599	599, 505, 431, 191, 135, 111	591, 535, 369, 295, 89, 1
8.12.623	623, 579, 572, 296, 225, 83	616, 601, 555, 313, 188, 117
8.12.657	657, 600, 530, 433, 219, 109	648, 622, 485, 471, 201, 125
8.12.815	815, 691, 655, 419, 279, 201	785, 771, 569, 409, 401, 45
8.12.828	828, 717, 610, 482, 305, 263	822, 740, 563, 505, 358, 207
8.12.877	877, 843, 699, 625, 199, 127	865, 859, 687, 633, 211, 107
8.12.889	889, 582, 564, 191, 185, 152	888, 628, 471, 361, 70, 31
8.12.915	915, 706, 679, 466, 311, 180	911, 756, 590, 509, 354, 95
8.12.951	951, 763, 695, 690, 463, 116	948, 785, 721, 597, 529, 50
8.12.963	963, 911, 695, 544, 477, 81	951, 929, 673, 563, 480, 51
8.12.1089	1089, 940, 938, 723, 631, 554	1086, 979, 887, 756, 590, 577
8.12.1663	1663, 1523, 1268, 939, 606, 355	1613, 1605, 1186, 993, 652, 269
8.12.1690	1690, 1516, 1229, 795, 511, 406	1670, 1565, 1141, 906, 479, 364
8.12.2107	2107, 1534, 1409, 726, 620, 153	2106, 1563, 1364, 791, 590, 17
8.12.2138	2138, 1847, 1490, 756, 543, 541	2109, 1935, 1228, 1162, 482, 281
8.12.2324	2324, 2137, 1452, 989, 661, 395	2300, 2181, 1244, 1243, 707, 89

Remarks:
Powers: 2, 4, 6, 8 with 6+6=12 terms.
Results of a selective search by Jarosław Wróblewski (January 2010).

FAILED numerical analysis of 8.12.2107

I NEED HELP !!!

Analysis of possible linear constrains in solution **8.12.2107** led me to the following substitutions:

Left side terms:

a + b + c + p
a + b - c + p
a - b + c + p
a - b - c + p
4 p - x
-2 a + 2 p + 2 x

Right side terms:

-a + b + c + p
-a + b - c + p
-a - b + c + p
-a - b - c + p
4 p + x
2 a + 2 p - 2 x

This solution is obtained with

a=1517/2
b=573/2
c=1381/2
p=743/2
x=77

Already works for **power 2**.

p can be obtained from equation for **power 4**. This leaves equations for **powers 6 and 8** in form of homogenuous polynomial equations of degree 6 and 9 in a,b,c,x:

```
4*a^6 - 4*a^4*b^2 - 4*a^4*c^2 + 4*a^2*b^2*c^2 - 64*a^5*x + 80*a^3*b^2*x -
32*a*b^4*x + 80*a^3*c^2*x - 32*a*b^2*c^2*x - 32*a*c^4*x + 272*a^4*x^2 -
208*a^2*b^2*x^2 + 16*b^4*x^2 - 208*a^2*c^2*x^2 + 96*b^2*c^2*x^2 +
16*c^4*x^2 - 484*a^3*x^3 + 220*a*b^2*x^3 + 220*a*c^2*x^3 + 384*a^2*x^4 -
88*b^2*x^4 - 88*c^2*x^4 - 133*a*x^5 + 21*x^6 = 0
```

```
32*a^7*b^2 - 32*a^5*b^4 + 32*a^7*c^2 - 64*a^5*b^2*c^2 + 32*a^3*b^4*c^2 -
32*a^5*c^4 + 32*a^3*b^2*c^4 + 800*a^8*x - 2096*a^6*b^2*x +
1680*a^4*b^4*x - 512*a^2*b^6*x - 2096*a^6*c^2*x + 3520*a^4*b^2*c^2*x -
1232*a^2*b^4*c^2*x + 1680*a^4*c^4*x - 1232*a^2*b^2*c^4*x - 512*a^2*c^6*x -
8080*a^7*x^2 + 13200*a^5*b^2*x^2 - 5696*a^3*b^4*x^2 + 128*a*b^6*x^2 +
13200*a^5*c^2*x^2 - 10192*a^3*b^2*c^2*x^2 + 1280*a*b^4*c^2*x^2 -
5696*a^3*c^4*x^2 + 1280*a*b^2*c^4*x^2 + 128*a*c^6*x^2 + 32420*a^6*x^3 -
32324*a^4*b^2*x^3 + 6320*a^2*b^4*x^3 + 64*b^6*x^3 - 32324*a^4*c^2*x^3 +
14580*a^2*b^2*c^2*x^3 + 960*b^4*c^2*x^3 + 6320*a^2*c^4*x^3 +
960*b^2*c^4*x^3 + 64*c^6*x^3 - 67680*a^5*x^4 + 40896*a^3*b^2*x^4 -
2752*a*b^4*x^4 + 40896*a^3*c^2*x^4 - 6624*a*b^2*c^2*x^4 - 2752*a*c^4*x^4 +
80560*a^4*x^5 - 30416*a^2*b^2*x^5 + 80*b^4*x^5 - 30416*a^2*c^2*x^5 +
480*b^2*c^2*x^5 + 80*c^4*x^5 - 56740*a^3*x^6 + 13192*a*b^2*x^6 +
13192*a*c^2*x^6 + 23665*a^2*x^7 - 2484*b^2*x^7 - 2484*c^2*x^7 -
5560*a*x^8 + 615*x^9 = 0
```

I do not know what to do next !!!