On equal sums of like powers

1 Introduction

lala

2 Sums of Fifth powers

$x^5 \equiv x \pmod{2, 3, 5, 6, 10, 15, 30}$
$x^5 \equiv (0, 1, 10) \pmod{11}$
$(x - 2a)^5 - 4(x - a)^5 + 6x^5 - 4(x + a)^5 + (x + 2a)^5 = 120a^4x$

3 Sums of sixth powers

$x^6 \equiv (0, 1) \pmod{7, 8, 9}$
$-(x-5)^6+5(x-3)^6-10(x-1)^6+10(x+1)^6-5(x+3)^6+(x+5)^6 = 23040x$

4 Sums of Seventh powers

We observe that:
$x^7 \equiv x \pmod{2, 3, 6, 7}$ $x^7 \equiv 0, \pm 1, \pm 12 \pmod{29}$

5 Sums of Eighth powers

5.1 8.1.17

Parametric solution from [3].

$$(2^{8k+4} + 1)^8 = (2^{8k+4} - 1)^8 + (2^{7k+4})^8 + (2^{k+1})^8 + 7((2^{5k+3})^8 + (2^{3k+2})^8)$$

where $k \geq 0$.

6 Sums of Tenth powers

We observe that $x^{10} \equiv 0 or 1 \pmod{11}$ according to $x \equiv 0$ or $x \not\equiv 0 \pmod{11}$.

7 Sums of Eleventh powers

We observe that:
$x^{11} \equiv x \pmod{2, 3, 11}$
$x^{11} \equiv (0, 1, 22) \pmod{23}$

8 Sums of Thirteenth powers

A solution to (13.13.13) can be found in [**?**]

References

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[3] L. J. Lander, T. R. Parkin and J. L. Selfridge, "A Survey of Equal Sums of Like Powers", *Mathematics of Computation*, **21**, 1967, pp. 446–459.

[4] K. Subba Rao, "On sums of fifth powers", *J. London Math. Soc.*, **9**, 1934, pp. 170–171.

[5] K. Subba Rao, "On sums of sixth powers", *J. London Math. Soc.*, **9**, 1934, pp. 172–173.

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[7] B. Scher, "Perfect Sums", *American Mathematical Monthly*, **99**, 1992, pp. 475–479. (survey)

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[9] Ajai Choudry, "On sums of eighth powers", *Journal of Number Theory*, **39**, 1991, pp. 104–107.

i	(x_1)	(y_1, y_2, y_3, y_4)	z	ref
1	(422481)	(414560, 217519, 95800)	31858749840007945920321	[1]
	(20615673)	(18796760, 15365639, 2682440)		[1]

Table 1: (4.1.3)

9 Primitive solutions of (4.1.3): $z = x_1^4 = \Sigma_{j=1}^{3} y_j^4$

See table 9.

10 Primitive solutions of (4.3.3): $z = x_1^4 = \Sigma_{j=1}^3 y_j^4$

Search for $(x_1, x_2, x_3) = (1..30, 1..x_1, 1..x_2)$. See table 10.

i	(x_1, x_2, x_3)	(y_1, y_2, y_3, y_4)	z	ref
	(6, 6, 3)	(7, 4, 2)		
	(8, 7, 3)	(9, 2, 1)		
	(10, 9, 1)	(11, 6, 5)		
	(12, 9, 6)	(13, 2, 2)		
	(12, 11, 1)	(13, 9, 4)		
	(13, 11, 2)	(14, 7, 7)		
	(14, 10, 9)	(15, 8, 4)		
	(16, 13, 3)	(17, 9, 8)		
	(16, 14, 7)	(18, 6, 3)		
	(16, 16, 9)	(18, 13, 8)		
	(17, 14, 3)	(18, 11, 7)		
	(17, 15, 2)	(18, 13, 5)		
	(17, 16, 1)	(19, 11, 8)		
	(17, 17, 8)	(19, 14, 7)		
	(17, 17, 10)	(20, 11, 7)		
	(18, 17, 10)	(20, 14, 3)		
	(19, 14, 10)	(20, 11, 8)		
	(19, 15, 4)	(20, 11, 9)		
	(19, 16, 1)	(21, 6, 3)		
	(19, 16, 14)	(22, 2, 1)		
	(19, 18, 1)	(21, 14, 7)		
	(19, 18, 4)	(22, 6, 1)		
	(19, 18, 16)	(23, 12, 4)		
	(20, 13, 9)	(21, 5, 2)		
	(20, 14, 3)	(18, 17, 10)		
	(20, 19, 13)	(23, 14, 5)		
	(21, 16, 8)	(22, 13, 6)		
	(21, 19, 2)	(23, 14, 9)		
	(21, 19, 10)	(24, 7, 5)		
	(22, 17, 5)	(23, 13, 10)		
	(22, 19, 3)	(23, 17, 6)		
	(23, 16, 6)	(24, 11, 4)		
	(23, 18, 2)	(24, 14, 11)		
	(23, 20, 3)	(25, 13, 12)		
	(23, 22, 1)	(26, 13, 13)		
	(23, 22, 21)	(29, 6, 1)		
	(23, 23, 20)	(29, 10, 7)		
	(24, 19, 5)	(25, 16, 9)		
	(24, 23, 1)	(27, 16, 11)		
	(24, 23, 14)	(28, 12, 11)		
	(25, 14, 13)	(26, 5, 1)		
	(25, 19, 6)	(26, 15, 11)		
	(25, 22, 3)	(27, 17, 10)		
	(25, 22, 18)	(27, 20, 14)		5
	(25, 23, 6)	(27, 19, 10)		
	(26, 15, 13)	(27, 8, 5)		
	(26, 20, 7)	(28, 8, 5)		
	(26, 25, 1)	(29, 19, 10)		
	(27, 16, 14)	(28, 12, 1)		
	(27, 20, 7)	(28, 15, 13)		
	(27, 22, 2)	(28, 19, 12)		
	(27, 23, 4)	(29, 17, 12)		
	(27, 23, 4)	(28, 21, 7)		
	(27, 25, 2)	(30, 17, 13)		
	(27, 26, 1)	(29, 23, 6)		
	(27, 26, 25)	(32, 23, 15)		
	(28, 21, 7)	(29, 17, 12)		
	(28, 21, 19)	(31, 11, 6)		
	(28, 23, 22)	(32, 16, 11)		
	(28, 26, 3)	(32, 12, 7)		
	(28, 27, 22)	(32, 24, 1)		
	(29, 22, 11)	(31, 13, 8)		
	(29, 24, 5)	(31, 16, 15)		
	(29, 25, 4)	(31, 20, 11)		
	(29, 25, 9)	(31, 19, 15)		
	(29, 26, 3)	(31, 22, 9)		
	(29, 26, 11)	(32, 19, 1)		
	(29, 27, 4)	(33, 14, 11)		
	(29, 28, 9)	(32, 23, 3)		
	(30, 27, 3)	(33, 18, 15)		
	(30, 29, 1)	(34, 19, 15)		
	(30, 29, 8)	(35, 12, 2)		

Table 2: (4.3.3)

11 Primitive solutions of (5.1.k): where...

- $x^5 = 3a^5 + 2b^5 + c^5$: No solutions for $xin(1, 400)$.
- $x^5 = (11, 1, 1)$: No solutions for $xin(1, 800)$.
- $x^5 = (6, 4, 1)$: No solutions for $xin(1, 300)$.
- $x^5 = (10, 1)$: No solutions for $xin(1, 1500)$.
- $x^5 = (7, 3, 1)$: No solutions for $xin(1, 500)$.
- $x^5 = (11, 3, 1)$: No solutions for $xin(1, 500)$.
- $x^5 = (2, 1, 1, 1)$: No solutions for $xin(1, 100)$.
- $x^5 = (8, 4, 2, 1)$: No solutions for $xin(1, 150)$.
- $x^5 = (2, 2, 1, 1)$: No solutions for $xin(1, 100)$.
- $x^5 = (5, 5, 1, 1)$: No solutions for $xin(1, 100)$.
- $x^5 = (20, 10, 5, 1, 1)$: No solutions for $xin(1, 96)$.
- $x^5 = (5, 3, 3, 1, 1)$: No solutions for $xin(1, 60)$.
- $x^5 = (3, 2, 2, 1, 1, 1, 1)$: $xin(1, 39)$: (18=12,13,10,10,10,3,3), (22=17,11,11,12,4,1,0), (23=17,13,12,15,9,9,9), (26=20,14,13,13,9,8,2), (27=21,12,12,16,8,7,5), (28=21,17,16,7,5,4,3), (33=21,25,16,22,10,4,2), (38=28,26,18,9,5,1,1)

i	(x_1)	(y_1, y_2, y_3, y_4)	z	ref
1	(144)	(133, 110, 84, 27)	61917364224	[3]

Table 3: (5.1.4)

12 Primitive solutions of (5.1.4): $z = x_1^5 = \Sigma_{j=1}^4 y_j^5$

Completely searched by [3] for $z \leq 765^5$.

I checked $(z)^5 = (765..2834)^5$. See table 12.

i	(x_1)	(y_1, y_2, y_3, y_4)	z	ref
1	(72)	(67, 47, 46, 43, 19)		[3]
2	(94)	(84, 79, 37, 23, 21)		[3]
3	(107)	(100, 80, 57, 43, 7)		[3]
4	(365)	(347, 259, 191, 120, 78)		[3]
5	(415)	(395, 261, 258, 202, 79)		
6	(427)			
7	(435)			
8	(480)			
9	(503)			
10	(530)			
11	(553)			
12	(575)			

Table 4: (5.1.5)

13 Primitive solutions of (5.1.5): $z = x_1^5 = \Sigma_{j=1}^4 y_j^5$

Completely searched by [3] for $z \leq 599^5$. See table 13.

I checked $x_1 = 600..606$.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6)$	z	ref
1	(12)	(11, 9, 7, 6, 5, 4)		[3]
2	(30)	(29, 19, 16, 11, 10, 5)		rizos
3	(32)	(28, 24, 22, 17, 16, 15)		rizos
4	(67)	(66, 36, 31, 23, 18, 13)		rizos
5	(67)	(66, 34, 31, 29, 20, 7)		rizos
6	(78)	(64, 61, 58, 48, 35, 22)		rizos
7	(99)	(96, 67, 20, 19, 13, 4)		rizos
8	(99)	(89, 73, 64, 60, 17, 6)		rizos

Table 5: Primitive solutions of (5.1.6)

14 Primitive solutions of (5.1.6): $z = x_1^5 = \Sigma_{j=1}^{6} y_j^5$

I checked $z \leq 101^5$. See table 14.

15 Primitive solutions of (5.1.7): $z = x_1^5 = \Sigma_{j=1}^7 y_j^5$

I searched from $1^5 to 60^5$. See table 15.

16 Primitive solutions of (5.1.k), $k > 7$

- k=8, (14)=(13,11,5,4,4,3,2,2), (17)=(15,12,11,10,10,8,7,4)
- k=9, (8)=(6,6,6,5,5,5,2,2,1), (10)=(8,7,7,7,7,1,1,1,1)
- k=10, (14)=(11,10,9,9,9,9,8,6,2,1), (15)=(12,12,11,8,8,7,7,4,3,3)
- k=11, (9)=(8,7,5,5,5,2,2,2,1,1,1), (12)=(10,9,8,7,7,6,5,5,5,5,5), (14)=(13,9,9,7,6,6,6,5,5,4,4) = (12,9,9,9,9,8,7,5,2,2,2) = (11,11,10,9,7,7,7,5,5,1,1)
- k=12, (7)=(6,5,5,4,4,3,3,3,1,1,1,1)
- k=13, (10)=(9,8,6,3,2,2,2,2,2,1,1,1,1)
- k=14, (6)=(5,5,3,3,3,3,3,3,2,2,1,1,1,1)=(5,4,4,4,4,3,3,2,2,1,1,1,1,1)
- k=15, (6)=(5,5,4,3,2,2,2,2,2,2,2,2,1,1,1)
- k=16, (7)=(6,6,3,3,3,3,3,2,1,1,1,1,1,1,1,1)
- k=17, (7)=(6,6,4,2,2,2,2,2,2,2,2,1,1,1,1,1,1)
- k=18, (5)=(4,4,3,3,3,3,2,2,2,1,1,1,1,1,1,1,1,1)
- k=19, (4)=(3,3,3,2,2,2,2,2,2,2,2,2,1,1,1,1,1,1,1)
- k=20, (8)=(7,6,5,4,4,3,3,3,3,3,3,3,3,3,3,3,3,2,2,2)= =(7,6,4,4,4,4,4,4,3,3,3,3,3,3,3,3,2,2,2,1)
- k=21, (6)=(5,5,4,3,3,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1)

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
1	(23)	(20, 18, 15, 14, 8, 7, 1)		[3]
2	(26)	(22, 21, 19, 11, 5^2, 3)		rizos
3	(30)	(29, 19, 15, 14, 6, 6, 1)		rizos
4	(30)	(27, 25, 10, 8, 8, 7, 5)		rizos
5	(34)	(30, 29, 13, 12, 5, 4, 1)		rizos
6	(35)	(32, 25, 23, 19, 12, 8, 6)		rizos
7	(38)	(37, 24, 18, 8, 5^2, 1)		rizos
8	(38)	(36, 27, 18^2, 14, 10, 5)		rizos
9	(40)	(35, 31, 29, 14, 10^2, 1)		rizos
10	(41)	(40, 25, 18, 17, 11^2, 9)		rizos
11	(42)	(40, 28, 25, 16, 12, 7, 4)		rizos
12	(49)	(41, 38, 34, 32, 23, 17, 14)		rizos
13	(50)	(38, 37^2, 34, 28, 18, 7)		rizos
14	(51)	(44, 41, 31, 30, 24, 20, 11)		rizos
15	(52)	(44, 44, 31, 27, 21, 18, 17)		rizos
16	(53)	(48, 36, 34^2, 24, 21, 6)		rizos
17	(54)	(49, 43, 30, 21, 15, 14, 2)		rizos
18	(54)	(49, 41, 35, 24, 12, 10, 3)		rizos
19	(55)	(50, 41, 37, 22, 13, 9, 3)		rizos
20	(56)	(51, 44, 27, 26, 24, 23, 11)		rizos
21	(56)	(47, 47, 33, 33, 26, 18, 2)		rizos
22	(56)	(46, 41, 39, 37, 37, 3, 3)		rizos
23	(57)	(52, 41, 38, 27, 24, 21, 4)		rizos
24	(58)	(56, 39, 25, 20, 18, 14, 6)		rizos
25	(58)	(53, 43, 34, 32, 26, 12, 8)		rizos
26	(58)	(52, 46, 34, 28, 23, 16, 9)		rizos
27	(59)	(56, 38, 34, 28, 27, 24, 2)		rizos
28	(60)	(58, 35, 32, 27, 27, 23, 8)		rizos
29	(60)	(52, 52, 27, 19, 12, 9, 9)		rizos

Table 6: Primitive solutions of (5.1.7)

i	(x_1, x_2)	(y_1, y_2, y_3)	z	ref
1				rizos

Table 7: (5.2.3)

17 Primitive solutions of (5.2.3): $z = x_1^5 + x_2^5 = \Sigma_{j=1}^3 y_j^5$

Completely searched by [3] for $z \leq 8.10^{12}$.

I searched for (x1,x2)=(340..1066,1..x1).

See table 17.

i	(x_1, x_2)	(y_1, y_2, y_3, y_4)	z	ref
1	(29, 3)	(28, 20, 10, 4)	20511392	...
	(38, 12)	(37, 25, 13, 5)		...
	(52, 28)	(50, 35, 29, 26)		...
	(64, 61)	(63, 62, 25, 5)		...
	(85, 16)	(82, 53, 50, 6)		...
	(96, 31)	(86, 72, 63, 56)		...
	(97, 63)	(99, 37, 13, 11)		...
	(99, 14)	(94, 67, 58, 44)		...
	(119, 41)	(114, 76, 72, 48)		rizos
	(127, 42)	(112, 97, 93, 17)		rizos
	(127, 109)	(137, 40, 35, 24)		rizos
	(134, 40)	(129, 92, 63, 10)		rizos
	(144, 45)	(130, 113, 87, 69)		rizos
	(156, 84)	(150, 105, 87, 78)		rizos
	(159, 84)	(135, 134, 109, 75)		rizos
	(161, 127)	(156, 134, 86, 62)		rizos
	(166, 154)	(174, 136, 83, 77)		rizos
	(192, 3)	(172, 159, 93, 71)		rizos
	(195, 60)	(191, 123, 52, 9)		rizos
	(197, 96)	(196, 101, 84, 62)		rizos

Table 8: Primitive solutions of (5.2.4)

18 Primitive solutions of (5.2.4): $z = x_1^5 + x_2^5 = \Sigma_{j=1}^{4} y_j^5$

Completely searched by [3] for $z \leq 2.10^{10}$.

I searched for (x1,x2)=(119..199,1..x1), (353,1..77).

See table 18.

19 Primitive solutions of (5.2.5): $z = x_1^5 + x_2^5 = \Sigma_{j=1}^{5} y_j^5$

Completely searched by [3] for $z \leq 2.8 \times 10^8$.

I checked from (x1,x2) = (39..53, 1..x1) See table 19.

i	(x_1, x_2)	(y_1, y_2, y_3, y_4)	z	ref
	(22, 1)	(21, 16, 7, 5, 4)		[4]
	(29, 23)	(30, 18, 14, 11, 9)		[3]
	(38, 16)	(33, 31, 26, 14, 10)		[3]
	(42, 24)	(36, 35, 29, 22, 4)		rizos and [3]
	(42, 36)	(44, 27, 26, 6, 5)		rizos and [3]
	(44, 30)	(45, 19, 17, 15, 8)		rizos and [3]
	(47, 45)	(49, 42, 14, 11, 6)		rizos
	(52, 17)	(47, 43, 22, 10, 7)		rizos

Table 9: primitive solutions of (5.2.5)

i	(x_1, x_2, x_3)	$(y_1, y_2, y_3, y_4, y_5)$	z	ref
	(7, 7, 3)	(8, 4, 2, 2, 1)		rizos
	(9, 8, 8)	(10, 7, 6, 1, 1)		rizos
	(15, 14, 3)	(16, 12, 2, 1, 1)		rizos

Table 10: primitive solutions of (5.3.5)

20 Primitive solutions of (5.3.5): $z = x_1^5 + x_2^5 = \Sigma_{j=1}^5 y_j^5$

I checked from $(x_1, x_2, x_3) = (1..15, 1..x_1, 1..x_2)$ See table 20.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(1141)	(1077,894,702,474,402,234,74)		[3]

Table 11: 6.1.7

i	(x_1, x_2)	(y_1, y_2, y_3, y_4)	z	ref

Table 12: (6.2.6)

21 Primitive solutions of (6.1.7): $z = x_1^6 = \Sigma_{j=1}^7 y_j^7$

Completely searched by [3] for $z \leq 1536^6$. See table 21.

22 Primitive solutions of (6.2.6): $z = \Sigma_{i=1}^2 x_i^6 = \Sigma_{j=1}^6 y_j^6$

I searched for $(x_1, x2) = (110..117, 1..x_1)^6$. I searched for $(x_1, x2) = (110..146, 1..3)^6$. see table 22.

i	(x_1, x_2)	(y_1, y_2, y_3, y_4)	z	ref
	(91, 56)	(78, 78, 69, 58, 36, 22, 18)	7^6.233.21841	[3]

Table 13: (6.2.7)

i	(x_1, x_2)	(y_1, y_2, y_3, y_4)	z	ref
	(12, 12)	(11^3, 9, 7, 4^2, 1^3)		rizos
	(18, 12)	(17, 14, 11^3, 5, 3, 2, 1^2)		rizos
	(18, 17)	(19, 14, 11^2, 5^2, 1^4)		rizos
	(18, 18)	(17^2, 13^4, 8, 7, 6, 5)		rizos
	(20, 18)	(19^2, 11, 10^2, 7, 5^2, 1^2)		rizos

Table 14: (6.2.10)

23 Primitive solutions of (6.2.7): $z = \Sigma_{i=1}^{2} x_i^6 = \Sigma_{j=1}^{6} y_j^6$

I searched for $(x_1, x_2) = (91..133, 1..x_1)$. I searched for $(x_1, x_2) = (134, 1..65)$. I searched for $(x_1, x_2) = (135, 1..56)$. I searched for $(x_1, x_2) = (136..138, 1..x_1)$. I searched for $(x_1, x_2) = (140, 1..x_1)$. I searched for $(x_1, x_2) = (147, 1..x_1)$. I searched for $(x_1, x_2) = (154, 1..91)$. I searched for $(x_1, x_2) = (161, 1..11)$. see table 23.

24 Primitive solutions of (6.2.10): $z = \Sigma_{i=1}^{2} x_i^6 = \Sigma_{j=1}^{10} y_j^6$

I searched for $(x_1, x2) = (1..20, 1..x_1)^6$. See table 24.

i	(x_1, x_2, x_3)	(y_1, y_2, y_3)	z	ref
1	(22, 19, 3)	(23, 15, 10)	160426514	[5]

Table 15: (6.3.3)

i	(x_1, x_2, x_3)	(y_1, y_2, y_3)	z	ref
	(23, 17, 13, 1)	(21, 21, 9, 3)		rizos

25 Primitive solutions of (6.3.3): $z = \Sigma_{i=1}^{3} x_i^6 = \Sigma_{j=1}^{3} y_j^6$

Completely searched by [3] for $z \leq 2.5 \times 10^14$. See Maths of Computation vol. 52, 1992. See table 25.

26 Primitive solutions of (6.4.4): $z = \Sigma_{i=1}^{4} x_i^6 = \Sigma_{j=1}^{4} y_j^6$

See table 26.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref

27 Primitive solutions of (7.1.k): where...

- $x^7 = 3a^7 + 2b^7 + c^7 + d^7 + e^7$: No solutions for $xin(1, 83)$.
- $x^7 = (4, 3, 2, 1)$: No solutions for $xin(1, 100)$.
- $x^7 = (7, 5, 1, 1)$: No solutions for $xin(1, 170)$.
- $x^7 = (21, 7, 1, 1)$: No solutions for $xin(1, 100)$.
- $x^7 = (11, 7, 5, 3, 1, 1)$: No solutions for $xin(1, 60)$.

28 Primitive solutions of (7.1.7): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Completely searched by [3] for $z \leq 110^7$. I searched for $z \in (111..131)$. See table 28.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
1	(102)	(90, 85, 83, 64, 58, 53, 35, 12)		[3]

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	()			rizos

29 Primitive solutions of (7.1.8): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

I searched for $z \in (132..267)$.

See table 29.

30 Primitive solutions of (7.1.10): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

I searched from $1^7 to 48^7$. None found. See table 30.

31 Primitive solutions of (7.1.13): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

I searched from $1^7 to 27^7$. None found. See table 31.

32 Primitive solutions of (7.1.14): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Searched from (1..27). See table 32.

33 Primitive solutions of (7.1.15): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Searched from (1..27). See table 33.

34 Primitive solutions of (7.1.16): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Searched from (1..20). See table 34.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(25)	$(22, 20^2, 19, 14, 12, 10, 8, 7^2, 6, 4, 2)$		rizos
	(27)	$(26, 20, 19, 14, 13^2, 10^2, 8, 7^2, 4, 2)$		rizos

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(16)	$(15, 12^2, 11, 8^3, 5, 4^3, 3^3)$		rizos
	(18)	$(17, 14, 12^2, 10^2, 9, 4, 3^2, 2^4)$		rizos
	(18)	$(16, 15, 14, 13, 8^2, 6^2, 3^4, 2^2)$		rizos
	(19)	$(17, 15^2, 14, 12, 6^2, 3^4, 2^3)$		rizos
	(23)	$(20^2, 17, 16, 14, 11^2, 10^2, 7^2, 4, 1^2)$		rizos
	(25)	$(24, 18^2, 14^2, 13, 10, 9, 8^2, 4^3, 3)$		rizos

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(23)	$(22, 18, 13^3, 12^3, 8, 6, 5, 4^3, 3)$		rizos
	(23)	$(21, 18, 17, 16^2, 12, 8^4, 5, 3^4)$		rizos
	(25)	$(20^2, 19^2, 18^2, 17, 14, 10, 8^2, 7, 6^2, 3)$		rizos
	(26)	$(23, 22, 19, 17, 15^4, 14, 11, 10^2, 5, 2, 1)$		rizos

35 Primitive solutions of (7.1.17): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Searched from (1..20). See table 35.

36 Primitive solutions of (7.1.18): $z = x_1^7 = \Sigma_{j=1}^7 y_j^7$

Searched from (1..20). See table 36.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
	(18)	$(16, 15, 13^2, 10^3, 9^3, 8, 7, 5^2, 3, 2)$		rizos

Table 16: 7.1.16

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(16)	$(14^2, 12, 11, 8, 5^2, 4, 3^9)$		rizos
	(17)	$(14^2, 13^2, 11^2, 10^3, 9, 5^3, 4, 3^3)$		rizos
	(19)	$(16^2, 15, 13, 12^3, 10, 9, 7, 6, 3^5, 2)$		rizos
	(20)	$(17, 16^2, 14, 13^3, 11^2, 5^2, 2^6)$		rizos

Table 17: 7.1.17

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(10)	$(9, 7^5, 6^3, 5^3, 4, 3^4, 1)$		rizos
	(16)	$(14, 13^2, 11, 9, 8^5, 7^2, 6^4, 3, 1)$		rizos
	(18)	$(17, 14, 13, 10^2, 9^2, 8, 6^7, 5, 4, 3)$		rizos
	(19)	$(18, 13^4, 10^2, 9, 8^2, 7^2, 4^2, 2^4)$		rizos
	(19)	$(15^4, 13, 12^3, 10^2, 9^3, 8^2, 7^2, 1)$		rizos
	(19)	$(15, 14^5, 13, 12^3, 10^2, 9, 6^3, 5, 1)$		rizos
	(20)	$(18, 14^5, 12^3, 10^3, 8, 6^4, 2)$		rizos

Table 18: 7.1.8

37 Primitive solutions of (7.2.7): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^7 y_j^7$

I searched for $(x_1, x_2) = (1..110, 1..x_1)^7$. I searched for $(x_1, x_2) = (129..143, 1..x_1)^7$. I searched for $(x_1, x_2) = (144, 1..125)^7$. I searched for $(x_1, x_2) = (145, 1..90)^7$. I searched for $(x_1, x_2) = (146, 1..87)^7$. I searched for $(x_1, x_2) = (147, 1..59)^7$. I searched for $(x_1, x_2) = (148, 1..64)^7$. I searched for $(x_1, x_2) = (149, 1..59)^7$. I searched for $(x_1, x_2) = (150, 1..64)^7$. I searched for $(x_1, x_2) = (151, 1..47)^7$. I searched for $(x_1, x_2) = (152, 1..x_1)^7$. I searched for $(x_1, x_2) = (153, 1..x_1)^7$. I searched for $(x_1, x_2) = (154, 1..58)^7$. I searched for $(x_1, x_2) = (155, 1..33)^7$. I searched for $(x_1, x_2) = (156, 1..x_1)^7$. I searched for $(x_1, x_2) = (157, 1..x_1)^7$. I searched for $(x_1, x_2) = (158, 1..32)^7$. I searched for $(x_1, x_2) = (159, 1..x_1)^7$. I searched for $(x_1, x_2) = (160, 1..145)^7$. I searched for $(x_1, x_2) = (161, 1..141)^7$. I searched for $(x_1, x_2) = (162, 1..138)^7$. I searched for $(x_1, x_2) = (163, 1..151)^7$. I searched for $(x_1, x_2) = (200, 1..98)^7$. I searched for $(x_1, x_2) = (201, 1..53)^7$.

See table 37.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
1	(128, 5)	(122, 106, 69, 60, 33, 31, 6)	7^2.19.96517.6264931	rizos

Table 19: 7.2.7

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
1	(33, 10)	(31, 28, 20, 15, 15, 7, 6, 5)	43.18397.53887	[3]
	(47, 43)	(48, 37, 34, 30, 30, 14, 13, 10)	$2.3^2.5.29.298253537$	rizos
	(61, 53)	(63, 42, 35, 32, 29, 28, 27, 26)	2.3.19.743.50972279	rizos
	(89, 57)	(76, 75, 72, 64, 62, 40, 36, 15)	2.73.316344057457	rizos
	(95, 26)	(84, 83, 71, 56, 54, 51, 39, 19)	$11^2.43.449.29896133$	rizos
	(95, 77)	(93, 81, 60, 29, 29, 20, 15, 13)	$2^2.29.43.211.81600821$	rizos
	(98, 2)	(94, 72, 69, 64, 36, 27, 19, 13)	$2^8.5^2.13564461457$	rizos
	(101, 26)	(99, 67, 64, 59, 51, 40, 25, 16)	$29.43^2.71.127.211.1051$	rizos
	(103, 83)	(93, 93, 74, 73, 67, 47, 29, 4)	2.3.31.807115255549	rizos
	(105, 19)	(96, 91, 70, 63, 54, 45, 21, 20)	$2^2.29.31.39129848759$	rizos
	(107, 97)	(102, 94, 86, 76, 73, 53, 11, 3)	$2^2.3.17.8233.143716483$	rizos
	(109, 65)	(97, 92, 81, 76, 75, 42, 30, 17)	2.3.29.71.15193956611	rizos
	(112, 89)	(113, 78, 74, 44, 21, 19, 14, 6)	3.67.1319897888737	rizos
	(114, 46)	(110, 89, 69, 63, 37, 35, 27, 24)	$2^11.5.29.844095827$	rizos
	(114, 89)	(109, 98, 79, 61, 58, 43, 28, 21)	$7^2.29.207219010573$	rizos
	(117, 47)	(114, 82, 78, 64, 61, 42, 39, 20)	$2^2.41.883.911.2278823$	rizos

Table 20: (7.2.8)

38 Primitive solutions of (7.2.8): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^{8} y_j^7$

I searched for $(x_1, x_2) = (1..115, 1..x_1)^7$. I searched for $(x_1, x_2) = (116, 1..79)^7$. I searched for $(x_1, x_2) = (117, 1..78)^7$. I searched for $(x_1, x_2) = (118, 1..60)^7$. I searched for $(x_1, x_2) = (119, 1..46)^7$. I searched for $(x_1, x_2) = (120, 1..26)^7$. I searched for $(x_1, x_2) = (121, 1..16)^7$. I searched for $(x_1, x_2) = (122, 1..9)^7$. I searched for $(x_1, x_2) = (123, 1..14)^7$. I searched for $(x_1, x_2) = (124, 1..13)^7$. I searched for $(x_1, x_2) = (125, 1..13)^7$. I searched for $(x_1, x_2) = (126, 1..12)^7$. I searched for $(x_1, x_2) = (127, 1..11)^7$. I searched for $(x_1, x_2) = (128, 1..12)^7$.

See table 38.

i	(x_1, x_2)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(33, 28)	(31, 29, 27, 18, 15, 14, 4, 4, 3)	61.491.631.2969	rizos

Table 21: (7.2.9)

39 Primitive solutions of (7.2.9): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^{9} y_j^7$

I searched for $(x_1, x_2) = (1..34, 1..x_1)^7$. I searched for $(x_1, x_2) = (35, 1..10)^7$. I searched for $(x_1, x_2) = (36, 1..24)^7$. See table 39.

i	(x_1, x_2)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(25, 14)	(21, 21, 20, 20, 12, 10, 7, 5, 4, 3)	3.13.4327.36793	rizos

Table 22: 7.2.10

i	(x_1, x_2)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(13, 13)	$(14, 11, 6, 5^3, 4^5, 2)$		rizos

Table 23: 7.2.12

40 Primitive solutions of (7.2.10): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^{9} y_j^7$

I searched for $(x_1, x_2) = (1..25, 1..x_1)^7$. See table 40.

41 Primitive solutions of (7.2.12): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^{9} y_j^7$

I searched for $(x_1, x_2) = (1..15, 1..x_1)^7$. See table 41.

42 Primitive solutions of (7.2.14): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^{9} y_j^7$

I searched for $(x_1, x_2) = (1..15, 1..x_1)^7$. See table 42.

i	(x_1, x_2)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	$(13, 9)$	$(12, 11, 8^3, 7^7, 5^2)$	2.11.953.3221	rizos
	$(15, 3)$	$(14, 12, 9^6, 7, 5, 4, 2^3)$	$2.3^8.29.449$	rizos
	$(15, 11)$	$(12^5, 9, 8^3, 5, 4^2, 3, 1)$	2.13.29.252449	rizos

Table 24: 7.2.14

i	(x_1, x_2, x_3)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(96, 41, 17)	(86, 77, 77, 68, 56)	$2.5.7^2.43.149.3539.6781$	rizos
	(153, 43, 14)	(140, 137, 59, 42, 42)	$2^2.3.7^3.469321.1016143$	rizos

Table 25: 7.3.5

43 Primitive solutions of (7.3.5): $z = x_1^7 + x_2^7 + x_3^7 = \Sigma_{j=1}^5 y_j^7$

Searched the same for (7.3.7) and

Searched $(x_1, x_2, x_3) = (97..187, 1..x_1, 1..x_2)$ Searched $(x_1, x_2, x_3) = (188, 1..175, 1..x_2)$ Searched $(x_1, x_2, x_3) = (189, 1..154, 1..x_2)$ Searched $(x_1, x_2, x_3) = (190, 1..161, 1..x_2)$ Searched $(x_1, x_2, x_3) = (191, 1..127, 1..x_2)$ Searched $(x_1, x_2, x_3) = (192, 1..160, 1..x_2)$ Searched $(x_1, x_2, x_3) = (193, 1..164, 1..x_2)$ Searched $(x_1, x_2, x_3) = (194, 1..101, 1..x_2)$ Searched $(x_1, x_2, x_3) = (195, 1..173, 1..x_2)$ Searched $(x_1, x_2, x_3) = (196, 1..172, 1..x_2)$ Searched $(x_1, x_2, x_3) = (197, 1..169, 1..x_2)$ Searched $(x_1, x_2, x_3) = (198, 1..170, 1..x_2)$ Searched $(x_1, x_2, x_3) = (199, 1..169, 1..x_2)$ Searched $(x_1, x_2, x_3) = (200, 1..109, 1..x_2)$ Searched $(x_1, x_2, x_3) = (201, 1..150, 1..x_2)$ Searched $(x_1, x_2, x_3) = (202, 1..149, 1..x_2)$ Searched $(x_1, x_2, x_3) = (203, 1..147, 1..x_2)$ Searched $(x_1, x_2, x_3) = (204, 1..145, 1..x_2)$ Searched $(x_1, x_2, x_3) = (205, 1..144, 1..x_2)$ Searched $(x_1, x_2, x_3) = (206, 1..138, 1..x_2)$ Searched $(x_1, x_2, x_3) = (207, 1..136, 1..x_2)$ Searched $(x_1, x_2, x_3) = (208, 1..135, 1..x_2)$ Searched $(x_1, x_2, x_3) = (209, 1..134, 1..x_2)$ Searched $(x_1, x_2, x_3) = (210, 1..132, 1..x_2)$ Searched $(x_1, x_2, x_3) = (211, 1..131, 1..x_2)$ Searched $(x_1, x_2, x_3) = (212, 1..130, 1..x_2)$ Searched $(x_1, x_2, x_3) = (213, 1..138, 1..x_2)$ Searched $(x_1, x_2, x_3) = (214, 1..134, 1..x_2)$ Searched $(x_1, x_2, x_3) = (215, 1..133, 1..x_2)$ Searched $(x_1, x_2, x_3) = (216, 1..132, 1..x_2)$ Searched $(x_1, x_2, x_3) = (217, 1..131, 1..x_2)$ See table **??**.

44 Primitive solutions of (7.3.7): $z = x_1^7 + x_2^7 + x_3^7 = \Sigma_{j=1}^7 y_j^7$

I searched for $(x_1, x_2, x_3) = (1..10, 1..x_1, 1..x_2)^7$. I searched for $(x_1, x_2, x_3) = (30..95, 1..x_1, 1..x_2)^7$. I searched for $(x_1, x_2, x_3) = (96, 1..88, 1..x_2)^7$. See table **??**.

i	(x_1, x_2, x_3)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(30, 30, 26)	(31, 28, 27, 16, 12, 7, 7)	$2^7.3359.120413$	[3]
	(56, 51, 46)	(60, 39, 38, 26, 20, 9, 3)	3.17.2521.3607.6599	rizos
	(62, 45, 21)	(60, 47, 44, 43, 9, 7, 2)	2.6037.322766701	rizos
	(69, 15, 1)	(66, 57, 32, 21, 16, 12, 7)	5.23677.62900909	rizos
	(75, 16, 14)	(72, 57, 49, 48, 36, 28, 25)	$3.5.7^2.17.19.67.839221$	rizos
	(75, 63, 63)	(73, 67, 57, 56, 46, 17, 11)	$3^7.1231.2731.2887$	rizos
	(75, 66, 5)	(70, 68, 61, 48, 38, 19, 10)	$2^4.19.59^2.17768969$	rizos
	(79, 62, 5)	(72, 70, 58, 58, 33, 19, 4)	$2^2.5681380917623$	rizos
	(80, 58, 57)	(82, 41, 25, 24, 17, 3, 3)	3.5.13.73.1765676267	rizos
	(81, 15, 10)	(71, 67, 63, 62, 42, 31, 22)	$2^5.17.9337.4503937$	rizos
	(81, 73, 13)	(84, 61, 52, 42, 27, 23, 4)		rizos
	(82, 66, 14)	(84, 49, 41, 21, 5, 3, 1)		rizos
	(83, 44, 5)	(76, 68, 67, 30, 22, 21, 16)		rizos
	(84, 20, 3)	(83, 52, 46, 44, 44, 43, 5)		rizos
	(84, 34, 13)	(79, 66, 61, 55, 41, 33, 6)		rizos
	(88, 35, 27)	(82, 73, 60, 53, 51, 37, 4)		rizos
	(90, 27, 21)	(86, 74, 51, 16, 15, 11, 11)		rizos
	(91, 13, 8)	(80, 70, 70, 69, 68, 35, 14)		rizos
	(91, 21, 8)	(89, 69, 15, 12, 10, 6, 3)		rizos
	(91, 55, 50)	(90, 63, 56, 44, 40, 19, 10)		rizos
	(96, 22, 22)	(95, 64, 50, 35, 35, 26, 3)		rizos

Table 26: 7.3.7

i	(x_1, x_2, x_3)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7)$	z	ref
	(10, 9, 9)	$(11, 5, 2^5, 1^2)$	2.7.41.89.383	rizos

Table 27: 7.3.9

i	(x_1, x_2, x_3, x_4)	$(y_1, y_2, y_3, y_4, y_5)$	z	ref
1	(50, 43, 16, 12)	(52, 29, 26, 11, 3)	$11.19^2.265266401$	[3]
	(81, 58, 19, 9)	(77, 68, 56, 48, 2)	13.113143.17055119	rizos
	(87, 74, 69, 40)	(82, 79, 75, 25, 9)	$2^2.3.461.10391712403$	rizos
	(98, 82, 58, 34)	(99, 75, 69, 16, 13)		rizos
	(99, 76, 32, 29)	(93, 88, 68, 36, 35)		rizos
	(104, 96, 60, 14)	(102, 95, 81, 57, 23)		rizos
	(111,102, 40, 29)	(112, 96, 82, 55, 21)		rizos
	(113,102,86,23)	(120, 81, 58, 55, 10)		rizos
	(196, 164, 116, 68)	(198, 150, 138, 32, 26)		rizos based on [2], p.507

45 Primitive solutions of (7.3.9): $z = x_1^7 + x_2^7 + x_3^7 = \Sigma_{j=1}^7 y_j^7$

I searched for $(x_1, x_2, x_3) = (1..15, 1..x_1, 1..x_2)^7$. See table **??**.

46 Primitive solutions of (7.4.5): $z = x_1^7 + x_2^7 = \Sigma_{j=1}^8 y_j^7$

I checked for $(x_1, x_2, x_3, x_4) = (50..111, 1..x_1, 1..x_2, 1..x_3)$ I checked for $(x_1, x_2, x_3, x_4) = (112, 1..101, 1..x_2, 1..x_3)$ I checked for $(x_1, x_2, x_3, x_4) = (113, 1..113, 1..x_2, 1..x_3)$ See table **??**.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(125)	(112, 106, 96, 93, 92, 70, 66, 44, 44, 18, 14)		[3]

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_7, y_8, y_9, y_{10})$	z	ref
1	(53)	(48, 46, 43, 30, 30, 28, 26, 26, 24, 24, 18, 16, 14)		rizos

Table 28: 8.1.13

47 Primitive solutions of (8.1.11): $z = x_1^8 = \Sigma_{j=1}^{11} y_j^8$

Searched for ( ) See table **??**.

48 Primitive solutions of (8.1.13): $z = x_1^8 = \Sigma_{j=1}^{13} y_j^8$

I searched for x_1=(1..54). See table **??**.

49 Primitive solutions of (8.2.9): $z = x_1^8 + x_2^8 = \Sigma_{j=1}^{10} y_j^8$

See table **??**. I searched for $(x_1, x_2) = (33..86, 1..x_1)^8$. I searched for $(x_1, x_2) = (87, 1..67)^8$. I searched for $(x_1, x_2) = (88, 1..64)^8$. I searched for $(x_1, x_2) = (89, 1..23)^8$. I searched for $(x_1, x_2) = (90, 1..17)^8$. I searched for $(x_1, x_2) = (91, 1..3)^8$. I searched for $(x_1, x_2) = (92, 1..6)^8$. I searched for $(x_1, x_2) = (93, 1..6)^8$. I searched for $(x_1, x_2) = (94, 1..7)^8$. I searched for $(x_1, x_2) = (95, 1..45)^8$.

50 Primitive solutions of (8.2.10): $z = x_1^8 + x_2^8 = \Sigma_{j=1}^{10} y_j^8$

I searched up to $(x_1, x_2) = (1..32, 1..x_1)^8$. None found. See table **??**.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_9)$	z	ref
1	(27, 11)	(24, 24, 20, 20, 17, 16, 8, 7, 2)	2.141321947681	[3]
	(73, 21)	(70, 62, 42, 34, 26, 12, 7, 5, 4)	2.17.53233.445598161	rizos

Table 29: Primitive solutions of (8.2.9)

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_{10})$	z	ref

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_8)$	z	ref
	(50, 17, 8)	(47, 40, 38, 38, 16, 16, 12, 6)	3^2.13.59.149.3041.12491	[3]
	(52, 51, 17)	(56, 34, 29, 26, 18, 18, 12, 1)	2.49617324429649	rizos
	(63, 51, 43)	(62, 52, 44, 42, 42, 27, 23, 21)	13.17.37.53549.697951	rizos
	(67, 31, 17)	(59, 58, 54, 49, 46, 39, 32, 2)	3.13.17.613767035221	rizos
	(75, 35, 16)	(70, 65, 56, 38, 38, 34, 31, 26)	2.97.1627.3178911667	rizos
	(93, 26, 11)	(91, 64, 64, 64, 51, 36, 28, 24)		rizos

51 Primitive solutions of (8.3.8): $z = x_1^8 + x_2^8 = \Sigma_{j=1}^{8} y_j^8$

I searched up to $(x_1, x_2, x_3) = (51..76, 1..x_1, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (77, 1..53, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (78, 1..44, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (79, 1..35, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (80, 1..36, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (81, 1..31, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (82, 1..29, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (83, 1..29, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (84, 1..24, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (85, 1..26, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (86, 1..20, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (87, 1..48, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (88, 1..47, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (89, 1..45, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (90, 1..42, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (91, 1..41, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (92, 1..41, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (93, 1..39, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (94, 1..38, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (95, 1..37, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (96, 1..32, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (97, 1..28, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (98, 1..27, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (99, 1..26, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (100, 1..29, 1..x_2)^8$. I searched up to $(x_1, x_2, x_3) = (101, 1..28, 1..x_2)^8$. See table **??**.

52 Primitive solutions of (8.4.6): $z = x_1^8 + x_2^8 = \Sigma_{j=1}^{6} y_j^8$

I searched up to $(x_1, x_2, x_3, x_4) = (36..51, 1..x_1, 1..x_2, 1..x_3)^8$. See table **??**.

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_6)$	z	ref
	(47, 29, 12, 5)	(45, 40, 30, 26, 23, 3)	3.683.63409.187123	rizos

i	(x_1)	$(y_1, y_2, y_3, y_4, y_5, y_6, y_8)$	z	ref
	(35, 20, 11, 6)	(34, 28, 22, 22, 16, 9, 7)		[3]
	(45, 32, 30, 29)	(44, 36, 34, 28, 21, 11, 8)		rizos
	(45, 41, 25, 21)	(46, 37, 33, 19, 17, 6, 4)		rizos
	(45, 42, 11, 5)	(44, 41, 38, 24, 17, 4, 3)		rizos
	(47, 31, 20, 15)	(46, 36, 34, 21, 6, 3, 1)		rizos

53 Primitive solutions of (8.4.7): $z = x_1^8 + x_2^8 = \Sigma_{j=1}^{7} y_j^8$

I searched up to $(x_1, x_2, x_3, x_4) = (36..49, 1..x_1, 1..x_2, 1..x_3)^8$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{14})$	z	ref
1	(66)	(63, 54, 51, 49, 38, 35, 29, 24, 21, 12, 10, 7, 2, 1)		rizos

Table 30: primitive solutions of (9.1.14)

54 Primitive solutions of (9.1.k): where...

- $x^9 = 7a^9 + 5b^9 + 3c^9 + d^9$: No solutions for $x \in (1, 250)$.
- $x^9 = (4, 3, 3, 2, 2, 1, 1)$: No solutions for $x \in (1, 51)$.
- $x^9 = (2, 2, 2, 2, 2, 1, 1, 1, 1, 1)$: No solutions for $x \in (1, 22)$.

55 Primitive solutions of (9.1.14): $z = x_1^9 = \Sigma_{j=1}^{14} y_j^9$

search myself (26..70). See table ??.

56 Primitive solutions of (9.1.15): $z = x_1^9 = \Sigma_{j=1}^{15} y_j^9$

search myself (26..67). See table ??.

57 Primitive solutions of (9.2.12): $z = x_1^9 + x_2^9 = \Sigma_{j=1}^{12} y_j^9$

I searched for $(x_1, x_2) = (1..61, 1..x_1)^9$. I searched for $(x_1, x_2) = (62, 1..48)^9$. I searched for $(x_1, x_2) = (63, 1..47)^9$. I searched for $(x_1, x_2) = (64, 1..33)^9$. I searched for $(x_1, x_2) = (65, 1..12)^9$. I searched for $(x_1, x_2) = (66, 1..x_1)^9$. I searched for $(x_1, x_2) = (73, (1, 11, 22, 33, 44, 55, 66))^9$.

See table ??.

58 Primitive solutions of (9.3.9): $z = x_1^9 + x_2^9 = \Sigma_{j=1}^{11} y_j^9$

I searched for $(x_1, x_2, x_3) = (31..67, 1..x_1, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (68, 1..62, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (69, 1..37, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (70, 1..52, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (71, 1..31, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (72, 1..25, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (73, 1..25, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (74, 1..23, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (75, 1..22, 1..x_2)^9$. I searched for $(x_1, x_2, x_3) = (76, 1..20, 1..x_2)^9$.

See table ??.

i	(x_1)	$(y_1, y_2, \ldots, y_{15})$	z	ref
1	(26)	$(23^2, 21^2, 18, 15, 10, 9^2, 7, 6^2, 4, 2^2)$	5429503678976	[3]
2	(43)	$(39, 38, 36, 27^3, 25, 19, 16, 12, 8, 5, 2, 1^2)$		rizos
3	(51)	$(50, 37^2, 35, 32, 25, 24, 20, 16^2, 13, 8, 4, 2^2)$		rizos
4	(52)	$(48, 45, 43, 36, 34, 24^2, 18^2, 15, 14, 13, 8, 7, 5)$		rizos
5	(53)	$(50, 42, 38^2, 37^2, 36^2, 34^2, 29, 26, 25, 21, 20)$		rizos
6	(55)	$(49^2, 45, 42, 36, 32^2, 27, 26, 18, 12, 7, 4, 3^2)$		rizos
7	(56)	$(53, 49, 41, 36, 32, 29, 27, 22, 20, 13, 11, 10, 6^2, 1)$		rizos
8	(58)	$(54, 51, 45, 41, 33, 31, 30, 28, 23, 18, 13, 11, 7, 2, 1)$		rizos
9	(58)	$(54, 51, 42, 42, 39, 35, 34, 30, 27, 18, 15, 15, 7, 6, 3)$		rizos
10	(58)	$(53, 49, 47, 41, 41, 40, 39, 39, 30, 29, 28, 22, 13, 6, 1)$		rizos
11	(62)	$(60, 46, 44, 43, 42, 41, 40, 39, 37, 35, 23, 21, 17, 16, 8)$		rizos
12	(62)	$(59, 51, 50, 40, 36^3, 30, 18, 16, 14, 12, 9^2, 6)$		rizos
13	(63)	$(62, 46^2, 35, 33^2, 32^2, 25^2, 24, 16, 6, 5, 3)$		rizos
14	(65)	$(64, 46, 43, 42, 41^2, 35, 34, 33, 30, 26, 18, 14^2, 4)$		rizos
15	(65)	$(60, 55, 54, 47, 45, 37, 33^2, 28, 27^2, 17, 8^2, 6)$		rizos
16	(66)	$(65, 47, 46, 43, 40, 39, 29, 28^2, 18, 17, 9, 8, 7, 2)$		rizos
17	(66)	$(57^3, 54, 42, 41, 33, 27, 26^2, 25, 21, 19, 16, 15)$		rizos
18	(67)	$(63, 58, 52, 43^2, 35^3, 33, 32, 31, 27^2, 18, 15)$		rizos
19	(67)	$(63, 57, 51, 50, 43, 41, 36, 21^2, 20, 19, 12^2, 7, 4)$		rizos
20	(67)	$(62, 60, 49, 48, 43, 33, 32, 31, 16, 14, 13, 11^2, 3, 1)$		rizos

Table 31: primitive solutions of (9.1.15)

i	(x_1, x_2)	$(y_1, y_2, \ldots, y_{12})$	z	ref
1	(21, 15)	$(19^2, 17, 16, 7, 4, 3^2, 2^4)$	$2^2.3^12.13.30133$	[3]
	(44, 9)	(43, 33, 33, 30, 23, 20, 20, 18, 8, 3, 1, 1)	53.163.1621.44139547	rizos
	(51,44)	$(48^2, 38, 35, 24, 19, 15, 14^2, 7^2, 6)$	5.19.73.487.2293.381223	rizos
	(62, 11)	(61, 44, 42, 41, 41, 35, 34, 30, 25, 18, 17, 15)	$7^2.67.73.56484792577$	rizos

i	(x_1, x_2, x_3)	$(y_1, y_2, \ldots, y_9)$	z	ref
1	(38, 38, 3)	(41, 23, 20, 20, 18, 13, 13, 12, 9)	11.23.1306056136543	rizos

Table 32: 9.3.9

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
1	(30, 16, 13)	$(29, 25, 21, 19^2, 9^2, 7, 6, 3, 2)$		[3]
	(33, 23, 23)	$(32, 29, 18, 17, 12, 8, 6^3, 4, 1)$		rizos

Table 33: 9.3.11

i	(x_1, x_2, x_3, x_4)	$(y_1, y_2, \ldots, y_9)$	z	ref
	(38,31,12,2)	(36,32,32,30,15,13,8,4,3)		rizos

59 Primitive solutions of (9.3.11): $z = x_1^9 + x_2^9 = \Sigma_{j=1}^{11} y_j^9$

I searched for $(x_1, x_2, x_3) = (31..38, 1..x_1, 1..x_2)^9$.

See table **??**.

60 Primitive solutions of (9.4.9): $z = x_1^9 + x_2^9 = \Sigma_{j=1}^{9} y_j^9$

I searched for $(x_1, x_2, x_3, x_4) = (22..41, 1..x_1, 1..x_2, 1..x_3)^9$.

See table **??**.

61 Primitive solutions of (9.4.10): $z = x_1^9 + x_2^9 = \Sigma_{j=1}^{10} y_j^9$

I searched for $(x_1, x_2, x_3, x_4) = (22..38, 1..x_1, 1..x_2, 1..x_3)^9$.

See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{10})$	z	ref
	(21,16,12,5)	(19,19,18,14,11,10,9,6,6,2)		[3]
	(35,35,27,2)	(36,32,30,26,23,21,21,12,12,6)		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
1	(33)	$(30^2, 26^2, 23, 21, 19, 18, 13^2, 12^2, 10^5, 9^2, 7, 6, 3)$		rizos

Table 34: primitive solutions of (10.1.22)

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
1	(15)	$(14, 13, 12^2, 10, 9^4, 7^6, 6, 3, 2, 1^5)$	576650390625	[3]
2	(21)	$(19, 18^2, 17, 15^2, 13, 12, 10^2, 9^5, 8, 7, 5^2, 3, 1^3)$	16679880978201	rizos
3	(27)	$(24, 23^3, 20, 19, 16, 14^2, 13, 10, 9^2, 8^4, 4^3, 3^2, 2)$		rizos
4	(33)	$(32, 26, 25^2, 23, 20, 18^5, 17, 16^2, 11, 10, 9^2, 7, 6, 4, 2, 1)$		rizos
5	(33)	$(31, 27^2, 25^2, 23^2, 21, 18^2, 17, 15, 12^2, 11, 10, 9^2, 7, 6, 1^3)$		rizos

Table 35: primitive solutions of (10.1.23)

62 Primitive solutions of (10.1.22): $z = x_1^{10} = \Sigma_{j=1}^{22} y_j^{10}$

search myself (33..42). See table ??.

63 Primitive solutions of (10.1.23): $z = x_1^{10} = \Sigma_{j=1}^{23} y_j^{10}$

search myself (15...33). See table ??.

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
	(35, 3)	$(33, 32, 24, 21, 20^2, 13^3, 12, 11, 9, 7, 1^2)$		rizos

Table 36: 10.2.15

64 Primitive solutions of (10.2.15): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{19} y_j^{10}$

I searched for $(x_1, x_2) = (17..40, 1..x_1)^{10}$. I searched for $(x_1, x_2) = (44, 1..33)^{10}$. See table **??**.

i	(x_1, x_2)	$(y_1, y_2, \ldots, y_{19})$	z	ref
1	(17, 9)	$(15^3, 12^2, 11^6, 10, 6, 5, 2^5)$		[3]

65 Primitive solutions of (10.2.19): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{19} y_j^{10}$

I searched for $(x_1, x_2) = (17..35, 1..x_1)^{10}$. See table **??**.

i	(x_1, x_2, x_3)	$(y_1, y_2, \ldots, y_{14})$	z	ref
	(30, 28, 4)	$(31, 23, 20^2, 17^2, 16, 10, 9^3, 5, 2^2)$		rizos
	(38, 37, 11)	$(39, 34, 29, 27^2, 22, 21, 18, 17, 15, 13, 9^2, 8)$		rizos
	(40, 22, 18)	$(39, 33, 30, 26, 25, 21, 13, 12, 8, 6, 4, 3^3)$		rizos
	(40, 25, 3)	$(37, 35^2, 27, 21, 20^3, 17, 13, 9, 2, 1^2)$		rizos
	(40, 25, 22)	$(39, 33, 30, 28, 23, 19, 16, 14, 12, 9^2, 7, 3^2)$		rizos
	(41, 18, 9)	$(37^2, 35, 30, 29, 21, 20, 19^2, 13, 6, 3, 2, 1)$		rizos
	(43, 24, 23)	$(39^2, 35, 31^2, 27^5, 18^2, 16, 4)$		rizos
	(44, 10, 1)	$(39^2, 37, 34^2, 33, 27^2, 20^2, 19^2, 17, 16)$		rizos

66 Primitive solutions of (10.3.14): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{14} y_j^{10}$

I searched for $(x_1, x_2, x_3) = (16..40, 1..x_1, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (41, 1..31, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (42, 1..32, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (43, 1..25, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (44, 1..35, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (45, 1..21, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (46, 1..10, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (47, 1..6, 1..x_2)$. I searched for $(x_1, x_2, x_3) = (48, 1..14, 1..x_2)$.

See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{24})$	z	ref
	(32, 13, 4)	$(29^2, 26, 25, 22, 21, 18, 15^2, 12^2, 8, 7, 5, 1)$		rizos
	(32, 28, 10)	$(30, 29, 26, 25^2, 23, 22, 20, 15, 13, 12, 9, 8, 6, 3)$		rizos

67 Primitive solutions of (10.3.15): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{15} y_j^{10}$

I searched for $(x_1, x_2, x_3) = (16..33, 1..x_1, 1..x_2)$.

See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{24})$	z	ref
1	(19, 14, 2)	$(18, 17, 15, 12^3, 11^2, 9^5, 8^2, 4)$		rizos
	(26, 24, 15)	$(25^2, 19^2, 17, 12, 11^2, 10^2, 7, 6, 4^2, 3, 2)$		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{24})$	z	ref
1	(15, 15, 11)	$(16, 12, 10, 8^7, 7, 4^{10}, 3, 2, 1)$		[3]
	(20, 14, 11)	$(18^2, 16, 15^4, 9, 8^3, 7^4, 6^5, 4^4)$		rizos
	(21, 11, 10)	$(17^7, 14^9, 7^2, 4^4, 3, 2)$		rizos
	(21, 15, 11)	$(18, 17^5, 16^3, 14, 10^3, 9^4, 7, 5, 4^3, 2^2)$		rizos

68 Primitive solutions of (10.3.16): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{24} y_j^{10}$

I searched for $(x_1, x_2, x_3) = (16..33, 1..x_1, 1..x_2)$.
See table ??.

69 Primitive solutions of (10.3.24): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{24} y_j^{10}$

I searched for $(x_1, x_2, x_3) = (16..21, 1..x_1, 1..x_2)$.
See table ??.

70 Primitive solutions of (10.4.13): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{24} y_j^{10}$

I searched for $(x_1, x_2, x_3, x_4) = (19..31, 1..x_1, 1..x_2, 1..x_3)$.
See table ??.

71 Primitive solutions of (10.4.14): $z = x_1^{10} + x_2^{10} = \Sigma_{j=1}^{24} y_j^{10}$

I searched for $(x_1, x_2, x_3, x_4) = (19..31, 1..x_1, 1..x_2, 1..x_3)$.
See table ??.

i	(x_1)	$(y_1, y_2, \ldots, y_{24})$	z	ref
	(33,24,22,6)	$(31, 29, 26, 25, 23, 23, 23, 21, 18, 13, 9, 8, 4)$		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{24})$	z	ref
	(27, 27, 15, 11)	$(28, 25, 20, 19, 18, 14^3, 10, 8, 7, 2^2, 1)$		rizos
	(33,26,25,1)	$(32, 30, 23, 20, 10^5, 9^2, 6^2, 2)$		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{31})$	z	ref
1	(28)	$(27, 23^2, 22, 18, 17^4, 16, 15, 14^3, 13, 12^4, 5^5, 4^3, 3^2)$		rizos

72 11,1,29

found by myself. Search range for z (1..28). See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{31})$	z	ref
1	(25)	$(22^3, 19^3, 18^4, 16, 13^3, 11^6, 7^3, 3^3, 2^4, 1)$		rizos
2	(28)	$(26^2, 22, 19^3, 15^2, 11^6, 8^2, 7, 6^2, 5^3, 4, 3, 2, 1^6)$		rizos

73 11,1,31

found by myself. Search up to $z = 28^11$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(22)	$(19^4, 17, 16^4, 14^2, 13^2, 12, 11^3, 10^4, 9, 7, 6^2, 5^3, 3^2, 2^2, 1^3)$		rizos
2	(24)	$(22^2, 19, 18, 17, 16^6, 15^2, 14^2, 13^3, 11^5, 10^2, 9, 8^3, 7, 5, 3, 2^3)$		rizos
3	(24)	$(22, 21^2, 17^5, 16, 15^4, 14^2, 13^2, 12, 11^2, 9^8, 8, 6, 5, 4^4)$		rizos
4	(25)	$(24, 22, 19, 17^2, 16^4, 15^2, 14, 11^2, 10^8, 9^2, 6^3, 2^2, 1^6)$		rizos
5	(25)	$(24, 20^4, 15, 14^8, 12^3, 8^3, 7, 6^4, 5^3, 3^4, 2^3)$		rizos
6	(25)	$(23^2, 21, 17, 16^4, 15^2, 14, 11^7, 10^3, 6^5, 5, 4^3, 3, 2^2, 1^2)$		rizos
7	(25)	$(23^2, 20, 19, 18, 17, 16, 15^2, 14^4, 13^3, 12, 11^4, 10^2, 9^5, 8^3, 7, 6, 1^2)$		rizos
8	(25)	$(23, 22^2, 18^2, 16^7, 15, 13, 11^2, 8^5, 6^5, 4, 3^2, 2^4, 1^2)$		rizos

74 11,1,35

found by myself. Search up to $z = 25^1 1$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(23)	$(22, 20, 19, 15^3, 14^3, 13^3, 12^4, 11^2, 10, 9^2, 8^2, 7^2, 5^4, 4, 3^2, 2^4)$		rizos
2	(23)	$(22, 19^2, 18, 16, 15^5, 14, 13^3, 11^3, 10, 8, 7^5, 6^3, 4^4, 3, 2^4)$		rizos

75 11,1,36

found by myself. Search up to $z = 23^11$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(22)	$(21, 18, 17^2, 16^2, 15^6, 14, 13^5, 11, 10^8, 9, 8^2, 6^4, 2, 1^2)$		rizos

76 11,1,37

found by myself. Search up to $z = 23^11$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(14)	$(12^4, 11^3, 10^2, 8^2, 7^2, 6, 5, 4^12, 3, 2^9, 1)$	4049565169664	rizos
2	(19)	$(17^2, 16^2, 14^2, 13^2, 11^3, 9^6, 8^4, 5, 4^3, 3^3, 2^8, 1^2)$	116490258898219	rizos
3	(22)	$(19^2, 18^3, 17^2, 16^4, 14^3, 13^4, 9^9, 8^2, 7, 6^3, 4, 3, 2^2, 1)$		rizos
4	(23)	$(22, 20, 18, 15^7, 14^6, 13^8, 10^2, 9, 8, 5^2, 4^3, 2^2, 1^3)$		rizos
5	(23)	$(21^2, 18, 17^3, 16^4, 13^6, 12^3, 11^6, 10, 7^4, 5^3, 3^2, 2^2, 1)$		rizos
6	(23)	$(21, 20^2, 19, 16^3, 15, 13^4, 12^9, 11^4, 8, 7^5, 5^5, 3, 1)$		rizos
7	(23)	$(21, 19^3, 17^3, 16^4, 15^8, 13^5, 12^2, 10, 9^4, 7^3, 6^2, 3, 1)$		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(18)	$(17, 15, 14^4, 13, 12, 11^8, 10^2, 9^3, 8^4, 6^6, 5^3, 4^2, 3^3)$		rizos
2	(21)	$(20, 17^3, 16, 15^2, 13^2, 12^2, 11^8, 10^4, 8^2, 5^2, 4, 3^7, 2, 1^3)$		rizos
3	(22)	$(21, 19, 17, 16^4, 14^2, 13, 12^3, 11, 10^4, 9^3, 7^5, 5^5, 2^8)$		rizos
4	(22)	$(21, 19, 17, 16, 15^3, 14^7, 13^4, 12^5, 11, 10^2, 8^2, 7^2, 5^2, 4^2, 3, 2^4)$		rizos
5	(22)	$(19^3, 17^6, 15^2, 13^3, 12^8, 11, 10^3, 8, 7, 5^4, 4^3, 3, 1^3)$		rizos
6	(22)	$(19^2, 18, 17^2, 16^10, 14^10, 13, 11, 8^3, 7^2, 6^2, 5^3, 3, 2)$		rizos

77 11,1,38

found by myself. Search up to $z = 23^11$. See table **??**.

78 11,1,39

found by myself. Search up to $z = 23^11$. See table **??**.

79 11,1,40

found by myself. Search up to $z = 23^11$. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{38})$	z	ref
1	(16)	$(14, 13^7, 12, 10, 9^4, 8^3, 6^8, 5^6, 3^2, 2^2, 1^5)$		rizos
2	(22)	$(20, 19, 18^4, 14, 12^2, 11, 9^4, 7^4, 5, 4^6, 3^6, 2^6, 1^3)$		rizos
3	(23)	$(22, 20, 18, 15^8, 14^6, 13^3, 11, 10^2, 9, 8^4, 5, 4^6, 3^5)$		rizos
4	(23)	$(21, 19^5, 14^3, 13, 12^7, 10^9, 8^4, 7^2, 6^2, 4^2, 2^4)$		rizos
5	(23)	$(20^3, 19, 18, 17^4, 14^4, 12^5, 11^2, 9, 8^5, 7^2, 6^3, 5^4, 4^2, 3^2, 1)$		rizos

i	(x_1, x_2)	$(y_1, y_2, \ldots, y_{30})$	z	ref
	(27, 14)	$(26, 22^2, 21, 20, 16^7, 15^5, 13, 11^3, 8, 6^2, 5, 2)$		rizos

i	(x_1, x_2)	$(y_1, y_2, \ldots, y_{30})$	z	ref
	(21, 5)	$(19^2, 17^3, 14, 13^5, 11^4, 10^3, 8^3, 7^2, 4, 3, 1^3)$		rizos
	(22, 22)	$(21, 20^3, 19, 16^4, 14^4, 11^3, 9, 8, 7^3, 3^3, 2^4)$		rizos
	(25, 6)	$(24, 22, 19, 18, 17^2, 16, 15, 12^3, 11, 9^3, 8^3, 7^4, 5^3, 3, 2, 1)$		rizos

80 Primitive solutions of (11.2.26): $z = x_1^{11} = \Sigma_{j=1}^{28} y_j^{12}$

I searched for $(x_1, x_2) = (1..26, 1..x_1)^{11}$. I searched for $(x_1, x_2) = (27, 1..17)^{11}$. See table **??**.

81 Primitive solutions of (11.2.28): $z = x_1^{11} = \Sigma_{j=1}^{28} y_j^{12}$

I searched for $(x_1, x_2) = (1..26, 1..x_1)^{11}$. I searched for $(x_1, x_2) = (27, 1..17)^{11}$. See table **??**.

82 Primitive solutions of (11.2.30): $z = x_1^{11} = \Sigma_{j=1}^{30} y_j^{12}$

I searched for $(x_1, x_2) = (1..21, 1..x_1)^{11}$. See table **??**.

83 Primitive solutions of (11.3.20): $z = x_1^{11} = \Sigma_{j=1}^{30} y_j^{12}$

I searched for $(x_1, x_2, x_3) = (10..27, 1..x_1, 1..x_2)^{11}$. I searched for $(x_1, x_2, x_3) = (28, 1..25, 1..x_2)^{11}$. See table **??**.

i	(x_1, x_2)	$(y_1, y_2, \ldots, y_{30})$	z	ref
	(21, 5)	$(19^2, 17^3, 14, 13^5, 11^4, 10^3, 8^3, 7^2, 4, 3, 1^3)$		rizos

i	(x_1, x_2, x_3)	$(y_1, y_2, \ldots, y_{20})$	z	ref
	(26,6,6)	$(25, 23, 19^2, 17^2, 15^3, 14, 13, 8^4, 3^2, 2^3)$		rizos

i	(x_1, x_2, x_3)	$(y_1, y_2, \ldots, y_{20})$	z	ref

84 Primitive solutions of (11.4.20): $z = x_1^{11} = \Sigma_{j=1}^{30} y_j^{12}$

I searched for $(x_1, x_2, x_3, x_4) = (9..23, 1..x_1, 1..x_2, 1..x_3)^{11}$. None found. See table **??**.

85 Primitive solutions of (12.1.40): $z = x_1^{12} = \Sigma_{j=1}^{40} y_j^{12}$

search myself (2..24). See table **??**.

86 Primitive solutions of (13.1.40): $z = x_1^{13} = \Sigma_{j=1}^{40} y_j^{12}$

search myself (1..25). None found. See table **??**.

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
1	(23)	$(21^2, 18^2, 17^4, 16^5, 15^8, 14^2, 8, 6^7, 5, 4^5, 3^2, 2)$		rizos
2	(24)	$(23, 20^2, 19, 18^2, 17, 16^3, 15^2, 14^3, 12^3, 10^3, 9, 8, 7, 6^4, 5^7, 4^2, 3, 2, 1)$		rizos
3	(24)	$(22^2, 20, 19^2, 18, 17, 16, 14^4, 12^2, 11^7, 8^3, 5^3, 3, 2^10, 1^2)$		rizos
4	(24)	$(22, 21^2, 20, 19, 17^2, 16^4, 15^2, 14, 12^3, 11^2, 10^4, 7, 6^2, 5^2, 4^3, 3^4, 2^5)$		rizos
5	(24)	$(22, 21, 20^2, 19, 18^5, 14^2, 10^6, 9^2, 8, 7, 6^4, 5^6, 4^3, 3, 1^4)$		rizos
6	(24)	$(21, 20^5, 19^2, 18^2, 16^5, 15^4, 12, 11, 10^5, 9^2, 8^3, 7^3, 4, 3^3, 2^2)$		rizos

i	(x_1)	$(y_1, y_2, \ldots, y_{23})$	z	ref
1				rizos