



Number on a side	Square Number	Triangular Number	Difference or Delta between Square #s and Triangular #s
1	$1 \times 1 = 1$ 	$1 = 1$	$1 - 1 = 0$
2	$2 \times 2 = 4$ 	$1 + 2 = 3$	$4 - 3 = 1$
3			
4			
5			
6			
7			

Number on a side	Square Number	Triangular Number	Difference or Delta between Square #s and Triangular #s
8			
9			
10			
11			
12			
13			
14			

Number on a side	Square Number	Triangular Number	Difference or Delta between Square #s and Triangular #s
1	$1 \times 1 = 1$	$1 = 1$	$1 - 1 = 0$
2	$2 \times 2 = 4$	$1 + 2 = 3$	$4 - 3 = 1$
3	9	6	3
4	16	10	6
5	25	15	10
6	36	21	15
7	49	28	21

Number on a side	Square Number	Triangular Number	Difference or Delta between Square #s and Triangular #s
8	64	36	28
9	81	45	36
10	100	55	45
11	121	66	55
12 (a "dozen")	144 (a "gross")	78	66
13	169	91	78
14	196	105	91

can you find any other
patterns in these numbers?

Level of Pyramid	# of spheres on that level (Square Numbers)	# of spheres on that level (Triangular Numbers)	Total # of spheres in square pyramid (Square Pyramidal Numbers)	Total # of spheres in triangular pyramid (Tetrahedral Numbers)
1	1	1	1	1
2	4	3	5	4
3	9	6	14	10
4	16	10	30	20
5	25	15	55	35
6	36	21	91	56
7	49	28	140	84
8	64	36	204	120
9	81	45	285	165
10	100	55	385	220
11	121	66	506	286
12	144 (a gross)	78	650	364
13	169	91	819	455
14	196	105	1015	560
15	225	120	1240	680
16	256	136	1496	816
17	289	153	1785	969
18	324	171	2109	1140
19	361	190	2470	1330

can you find any other
patterns in these numbers?

Level of Pyramid	# of spheres on that level (Square Numbers)	# of spheres on that level (Triangular Numbers)	Total # of spheres in square pyramid (Square Pyramidal Numbers)	Total # of spheres in triangular pyramid (Tetrahedral Numbers)
1	1	1	1 > 1	1 > 1
2	4	3	5 > 4	4 > 6
3	9	6	14 > 16	10 > 10
4	16 > 9	10	30 > 25	20
5	25 > 11	15	55	35
6	36 > 13	21	91	56
7	49 > 15	28	140	84
8	64 > 17	36	204	120
9	81 > 19	45	285	165
10	100 > 21	55	385	220
11	121	66	506	286
12	144 (a gross)	78	650	364
13	169	91	819	455
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16	256	136	1496	816
17	289	153	1785	969
18	324	171	2109	1140
19	361	190	2470	1330

- the differences of each square number are consecutive odd numbers.
- the differences of each triangular number are consecutive whole numbers.
- the differences of each Square Pyramidal Numbers are square numbers.
- the differences of each Tetra Pyramidal Numbers are triangular numbers

