

standard collatz view - even boxes can be opened by  $(n-1)/3$  where n is even has integer result

n2	128	384	640	896	1152	1408	1664	1920	2176	2432	2688	2944
n2	64	192	320	448	576	704	832	960	1088	1216	1344	1472
n2	32	96	160	224	288	352	416	480	544	608	672	736
n2	16	48	80	112	144	176	208	240	272	304	336	368
n2	8	24	40	56	72	88	104	120	136	152	168	184
n2	4	12	20	28	36	44	52	60	68	76	84	92
n2	2	6	10	14	18	22	26	30	34	38	42	46
base odd	1	3	5	7	9	11	13	15	17	19	21	23
3n+1 (containing even)	4	10	16	22	28	34	40	46	52	58	64	70

Opening of boxes for A,B,C tower types yields:

	Type A	$(n-1)/3$	Type B	$(n-1)/3$	Type C	$(n-1)/3$
n2	128	42.33333333333333	384	127.66666666666667	640	213
n2	64	21	192	63.66666666666667	320	106.33333333333333
n2	32	10.333333333333333	96	31.66666666666667	160	53
n2	16	5	48	15.66666666666667	80	26.33333333333333
n2	8	2.333333333333333	24	7.66666666666667	40	13
n2	4	1	12	3.66666666666667	20	6.333333333333333
n2	2	0.3333333333333333	6	1.66666666666667	10	3
base odd	1		3		5	

$4x+1$  allows travel from first link to all higher links via "chess move"

build direction			
heading away from 1	starting value	3	
	$3x+1$	containing box 10	we have moved back to tower 5
	$2x$	climb to 20	
	$2x$	climb to 40	next higher link on tower 5 is here
	$(x-1)/3$	open box to find 13	
	$(4*(3x+1)-1)/3$	combined equation	simplifies to $4x+1$
traverse direction			
heading towards 1	starting value x	13	
	$3x+1$	containing box 40	
	$x/2$	move down to 20	
	$x/2$	move down to 10	next lower link found here
	$(x-1)/3$	open box to find 3	
	$((3x+1)/4)-1/3$	3	simplifies to $(x-1)/4$
		.25x	

### First link formulas

	x mod 3 residue 2=C			x mod 2 residue 1=A	
<b>build direction</b>	type C starting value x	5		type A starting value x	7
	x2	first box will contain link. here we find box 10		x2	first box will not have link. here we find box 14
	(x-1)/3	open box to find first link 3		x2	second box will contain link. here we find box 28
				(x-1)/3	open box to find first link 9
<b>combined equation</b>	(2x-1)/3	simplified at (2x-1)/3		(4x-1)/3	simplified at (4x-1)/3
<b>standard collatz</b>					
<b>traverse direction</b>	starting value x	3		starting value x	9
	3x+1	10		3x+1	28
	x/2	5		x/2	14
				x/2	7
	(3x+1)/2	simplifies to (3x+1)/2		(3x+1)/4	simplifies to (3x+1)/4
		1.5x			.75x

### Collatz odd network connections

4x+1	341	853	2389	1877	4437	2901	6485	3925	8533	4949	10581	5973	12629	6997	14677							
4x+1	85	213	597	469	1109	725	1621	981	2133	1237	2645	1493	3157	1749	3669							
4x+1	21	53	149	117	277	181	405	245	533	309	661	373	789	437	917							
4x+1	5	13	37	29	69	45	101	61	133	77	165	93	197	109	229							
A: first link	1		9		17		25		33		41		49		57							
C: first link		3		7		11		15		19		23		27								
base odd	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43
type	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A

### x mod 8

	x	mod 8	type	traversal
	1	1	first link A tower	.75x
	3	3	first link C tower	1.5x
	5	5	4x+1	.25x
	7	7	first link A tower	.75x
	9	1	first link A tower	.75x
	11	3	first link C tower	1.5x
	13	5	4x+1	.25x
	15	7	first link A tower	.75x