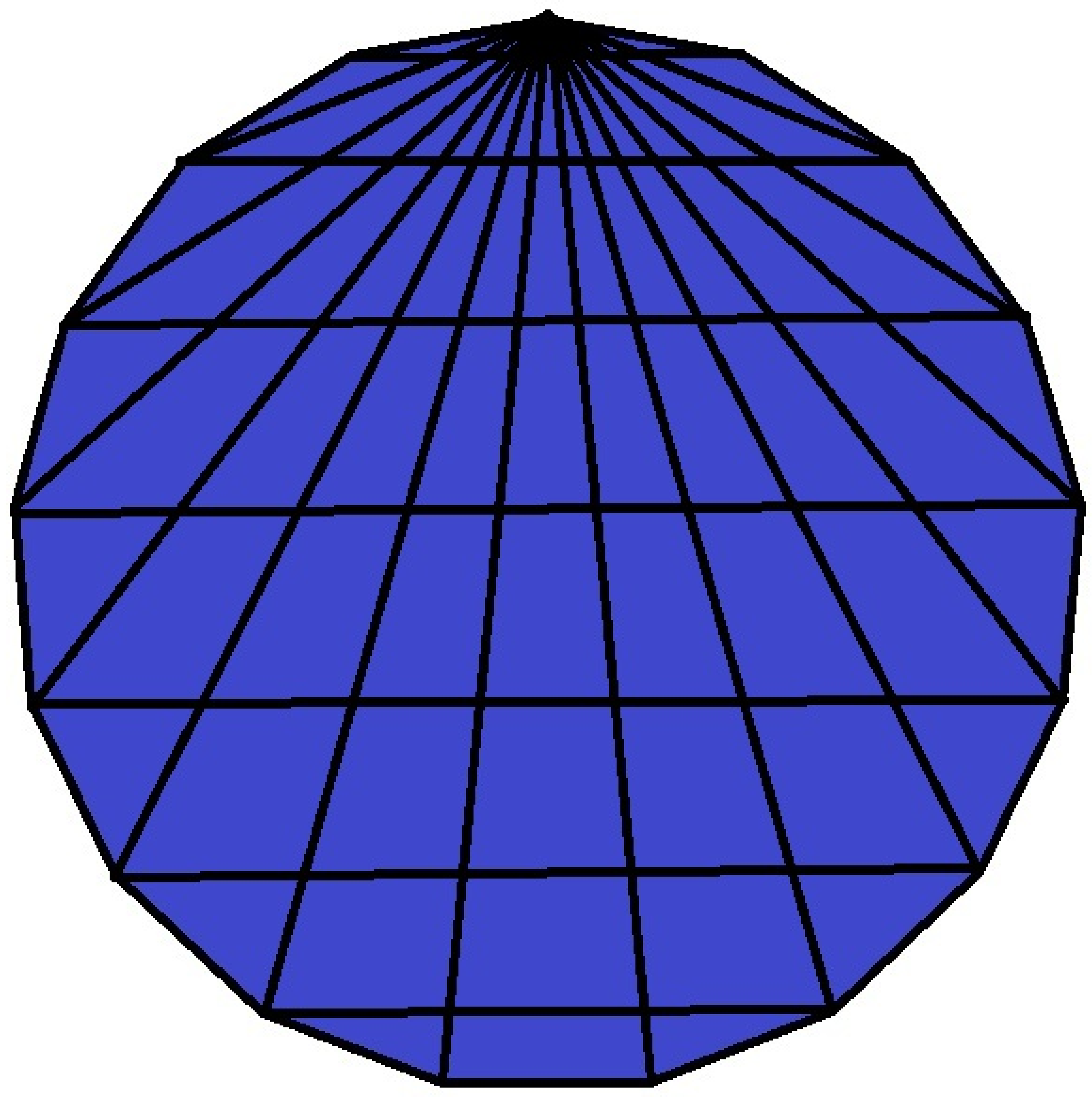
Eighth Order PHI – Fermat's Third Prime: 17

Fermat devised a series of integers based on this formula: $2^{2^n} + 1$, wherein n = {0, 1, 2, 3, 4}. We'll ignore his premise of these being an infinite series of primes, because I'm only interested in their associated series of numbers: $2^{(2^n - 1)}$, wherein n = {0, 1, 2, 3, 4, ...?}. And for the purposes of this webpage, I'll only focus on the third 'n' of n = 2, thereby: $2^{(2^2 - 1)} = 2^{(4 - 1)} = 2^3 = 8$. The eighth order Golden Series of Numbers and Golden Integers and its associated Golden Polynomial are all embedded within Fermat's third prime for this series, namely: the [17-sided regular polygon](), or [heptadecagon...]()

n	0	1	2	3	4	5
a	1	1	8	36	204	1086
b	0	1	7	35	196	1050
c	0	1	6	33	181	979
d	0	1	5	30	160	875
e	0	1	4	26	134	741
f	0	1	3	21	104	581
g	0	1	2	15	71	400
h	0	1	1	8	36	204



PHI series of numbers, 8th order:

a	b	c	d	e	f	g	h
1	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
8	7	6	5	4	3	2	1
36	35	33	30	26	21	15	8
204	196	181	160	134	104	71	36
1086	1050	979	875	741	581	400	204
5916	5712	5312	4731	3990	3115	2136	1086
31998	30912	28776	25661	21671	16940	11628	5916
173502	167586	155958	139018	117347	91686	62910	31998
940005	908007	845097	753411	636064	497046	341088	173502
5094220	4920718	4579630	4082584	3446520	2693109	1848012	940005
27604798	26664793	24816781	22123672	18677152	14594568	10014938	5094220
149590922	144496702	134481764	119887196	101210044	79086372	54269591	27604798
810627389	783022591	728753000	649666628	548456584	428569388	294087624	149590922
4392774126	4243183204	3949095580	3520526192	2972069608	2322402980	1593649980	810627389
23804329059	22993701670	21400051690	19077648710	16105579102	12585052910	8635957330	4392774126
128995094597	124602320471	115966363141	103381310231	87275731129	68198082419	46798030729	23804329059
699021261776	675216932717	628418901988	560220819569	472945088440	369563778209	253597415068	128995094597
3787979292364	3658984197767	3405386782699	3035823004490	2562877916050	2002657096481	1374238194493	699021261776
20526967746120	19827946484344	18453708289851	16451051193370	13888173277320	10852350272830	7446963490131	3787979292364
111235140046330	107447160753966	100000197263835	89147846991005	75259673713685	58808622520315	40354914230464	20526967746120
602780523265720	582253555519600	541898641289136	483090018768821	407830345055136	318682498064131	218682300800296	111235140046330
3266453022809170	3155217882762840	2936535581962544	2617853083898413	2210022738843277	1726932720074456	1185034078785320	602780523265720
17700829632401740	17098049109136020	15913015030350700	14186082310276244	11976059571432967	9358206487534554	6421670905572010	3266453022809170
95920366069513405	92653913046704235	86232242141132225	76874035653597671	64897976082164704	50711893771888460	34798878741537760	17700829632401740
519790135138940200	502089305506538460	467290426765000700	416578532993112240	351680556910947536	274806521257349865	188574279116217640	95920366069513405
2816730123757620046	2720809757688106641	2532235478571889001	2257428957314539136	1905748400403591600	1489169867410479360	1021879440645478660	519790135138940200

After 26 iterations, the approximation of the eight roots of the 8th order of PHI *accurate to eleven decimal places* are...

X_1 = a/h = 2816730123757620046 ÷ 519790135138940200 = 5.4189757237403
X_2 = b/f = 2720809757688106641 ÷ 1489169867410479360 = 1.8270647407198
X_3 = c/d = 2532235478571889001 ÷ 2257428957314539136 = 1.1217342943914
X_4 = d/b = 2257428957314539136 ÷ 2720809757688106641 = 0.82969011373757
X_5 = e/a = 1905748400403591600 ÷ 2816730123757620046 = 0.67658182242225
X_6 = f/c = 1489169867410479360 ÷ 2532235478571889001 = 0.58808506555256
X_7 = g/e = 1021879440645478660 ÷ 1905748400403591600 = 0.53620899822299
X_8 = h/g = 519790135138940200 ÷ 1021879440645478660 = 0.50866091875829
