

Hand calculation, reciprocal of 499

When you look at the reciprocal of 499 which is a very interesting number just one unit under 500 the repeating digits also have some noteworthy series of digits. Starting from digit position 1; 002 004 008 016 032 064 128 256; note how the numbers double from one group to the next. Then starting from digit position 338; 88 777 555 11 022 044 088; two or three digits in a row especially the last four groups double from one to the next. These are two groups of very interesting digit sequences

William Shanks is one of several men who did the hand calculation of the reciprocal of 499. In Williams' calculation he had to do the term for $(1/5)^{499}/499$ which has 348 leading 0's which does not count, followed by 151 digits for the power of 2 which also does not count, which leaves last 210 trailing 0's for some of the digits from the 498 digits of the reciprocal of 499. As it turns out the starting point of this number is from the fourth digit on as you can see he did 210 of the total 498 not the complete 498 for the total number of required digits. William Shanks had to do all the reciprocal of all the odd numbers up to 1009.

The last person to calculate the number γ 0.5772156649 was J. C. Adams on December 6, 1877 he published 264 and 265 digits say he calculated 270 digits that still fall short of the 498 required digits J. C. Adams had to do all the reciprocal of all the numbers up to 1000.

On the next 17 pages have the hand calculation for the reciprocal of 499 which I have done for the fun of it. Since there seems to be no other person who has done the complete calculation this is the first time it has been done. A computer program does not create this detailed level of calculation.

$\frac{1}{499}$ A

00200 40080 16032 06412 82565 13026
499) 1.00000 00000 00000 00000 00000 00000

998

2000

1280

1996

998

4000

2820

3992

2495

800

3250

499

2994

3010

2560

2994

2495

1600

650

1497

499

1030

1510

998

1497

1 499

3200

1300

2 998

2994

998

3 1497

2060

3020

4 1996

1996

2994

5 2495

640

260

6 2994

499

7 3493

1410

8 3992

998

9 4491

4120

10 4990

3992

128

$\frac{1}{499}$ B

05210 4208416833 66733 46693 38677
26 00000 00000 00000 00000 00000 00000
24 95

1050	3330	4330
998	2994	3992
520	3360	3380
499	2994	2994
2100	3660	3860
1996	3493	3493
1040	1670	3670
998	1497	3493
4200	1730	177
3992	1497	
2080	2330	
1976	1996	
840	3340	
499	2994	
3410	3760	
2994	2994	
4160	4660	
3992	4491	
1680	1690	
1497	1497	
1830	1930	
1497	1497	
3330	4330	

$\frac{1}{499}$ C

35470 94188 37675 35070 14028 05211
177 00000 00000 00000 00000 00000 00000
1497

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2350

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3493

4700

4491

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4180

3992

1880

1497

3830

3493

3370

2994

3760

3760

3493

2670

2495

1750

1497

2530

2495

03500

3493

700

499

2010

1996

1400

998

4020

3992

2800

2495

3050

2994

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560

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610

499

111

$\frac{1}{499}$ D

222444889779559 11823 64729 45891
00000 00000 00000 00000 00000 00000
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2495

1470
998

1220
998

2950
2495

4720
4491

2220
1996

4550
4491

2290
1996

2240
1996

590
499

2940
2495

2440
1996

910
499

4450
3992

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3992

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3992

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4880
4491

1820
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391

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2994

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1996

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4491

3640
3493

279

147

499 E

78356 71342 68537 07414 82965 93186

391 0000 0000 0000 0000 0000 0000
3493

4170	2680	2960
3992	2495	2495
1780	1850	4650
1497	1497	4491
2830	3530	1590
2495	3493	1497
3350	3700	930
2994	3493	499
3560	2070	4310
3493	1996	3992
670	740	3180
499	499	2994
1710	2410	1860
1497	1996	
2130	4140	
1996	3992	
1340	1480	
998	998	
3420	4820	
2994	4491	
4260	3290	
3992	2994	
268	296	

$\frac{1}{499}$ F

37274	54909	81963	92785	57114	22845
186 00000	00000	00000	00000	00000	00000
149 7					
3630	3190		2110		
3493	2994		1996		
1370	1960		1140		
998	1497		998		
3720	4630		1420		
3493	4491		998		
2270	1390		4220		
1996	998		3992		
2740	3920		2280		
2495	3493		1996		
2450	4270		2840		
1996	3992		2495		
4540	2780		345		
4491	2495				
4900	2850				
4491	2495				
4090	3550				
3992	3493				
980	570				
499	499				
4810	710				
4491	499				
319	211				

499 9

69138 27655 31062 12424 84969 93987
345 00000 00000 00000 00000 00000 00000

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4690

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$\frac{1}{499} \text{ I}$

37474 94989 97995 99198 39679 35871
187 00000 00000 00000 00000 00000 00000
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870

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4	1996
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8	3992
9	4491