$gcd(a,b) = gcd(a', b) = gcd(b, a')$

Example

b = 15 a = 70

15 | 70 → 4 = q

60

a' = 10 | 105 → b

10

5 | 10

10

x | 5

gcd(15, 70)

gcd(10, 15)

gcd(5, 10)

gcd(0, 5)

a is reduced by factor 2

length(a.b)

$10 + 15 \cdot 4 = a$

$a' + b \cdot q = a$

Sum of Squared Fibonacci Number

$F_1^2 + F_2^2 + F_3 \dots F_n^2 = \sum_{i=1}^{n} F_i^2$

n	F_n	$(F_i)^2$
1	1	1
2	1	2 = 1×2
3	2	6 = 2×3
4	3	15 = 3×5
5	5	40 = 5×8
6	8	104 = 8×13
7	13	

$\sum_{i=1}^{n} F_i^2 = F_n F_{n+1}$

---

20 8

a → 8 | 20 ← b

2

8 | 20

16

4 | 8

0 | 4

gcb(a, b) gcd(8, 20)

gcd(r, b) gcd(4, 8)

gcd(0, 4)

a=0 return b

2 | 6 · 8

3 | 3 · 4

4 | 1 · 4

1 | 1 = 1

(6, 8)

(6, 8) (2, 6)

2

(3, 4) 4 % 3 = 1

1

(3, 4) (8, 16)

16 % 8 = 0

1

8 | 8

6 | 3

2 | 6

6

0 | 2

Q7

Partial Sum

First calculate length of period

10 200

Q6

200 %

1

60 | 100

60

40

270 % 3

90

3 | 270

27

0

90 · 3

Understanding Fibonacci Series

F_i mod 2 Series

Period of (2) = 3

Summation Theory

011 index = 0
011
011
011
011
F_{13}

Let say $n = 13$

$\Sigma F_{13} = 9$

$9 \% 2 = 1$

NOW $n = 13 \% \text{ period}(2)$

$n = 13 \% 3$

$n = 1$

$\Sigma F_1 = 1$

$1 \% 2 = 1$

Conclusion

Sum of Squaress

$\Sigma F_n^2 =$

n	F_n	F_n^2	ΣF_n^2	
0	0	0	0	
1	1	1	1	
2	1	1	2	c1 x 2
3	2	4	6	3x2
4	3	9	15	3x5
5	5	25	40	5x8
6	8	64	104	