

⑦  $7, 47, 99$   
 $\rightarrow \boxed{48, 48}$

⑧  $30+20+45 = 1h35$   
 $14h40 + 1h35 = \boxed{16h15}$

⑨  $4 \times 6 = 24$   
 $5 \times 9 = 45$   
 $2 \times 11 = 22$   


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 $91$

12-1?  $\boxed{5 \times 6}$

⑩ ~~any~~  $a+b$   
 $a = 19 - b \rightarrow a+b = \boxed{19}$

⑪  $91 \times 12 = 7 \times \underbrace{(13 \times 12)}_{156}$

$7 \times 91$ , reste  $5 \times 91$  à partager en 7

$91 = 65 + 26$   
 $[9 + 2]$

$5+2$   
 $5+2$   
 $5+1+1$   
 $5+2$   
 $5+2$

$7+5+3+3 = \boxed{18}$

⑫  $f, f+1, f+2$

$n, n+1, \dots, n+4$

$p, p+1, \dots, p+6$

$3f+3 = 5n+10 = 7p+21 = x \quad x = 3 \times 5 \times 7 = 105$

$c = 2(f+1) = \frac{2}{3} 105 = \boxed{70}$

13)  $\rightarrow$  m tous impairs?

1 3 5 7 9 11 13 15

~~1 3 5 7 9 11 13 15~~

15) 0, 1, 2, ..., 55 [111]  $\rightarrow$  56 nb.

Si  $n \in E$ , alors  $11-n \notin E$   
et  $n \neq 0$

$\rightarrow$  élimine  $\frac{110}{2} = 55$  nombres.

$N_{\max} \leq 111 - 55 = \boxed{56}$

$56 + 1 = \boxed{57}$

16)  $E = \{0, \dots\}$

$\forall (x, y) \in E^2$

$\forall 1 \leq n \leq 11, \exists (x, y) \in E^2, x - y = n$

- 11
- 10 = 11 - 1
- 9 = 11 - 2
- 8 = 11 - 3
- 7 = 11 - 4
- 6 = 11 - 5

$\rightarrow 1, 2, \del{3}, 4, 5, 11? \rightarrow 26$

~~11, 9, 7, 5, 4~~

Golomb

~~4~~ 4 marques  $\rightarrow$  10 poss.  $< 11 \rightarrow$  impossible

$\rightarrow$  5 marques.

0, 1, 3, ~~4~~, 5, 11

0, 1, 2, ~~3~~, 8, 11

~~0, 1, 2, 3, 4, 11~~

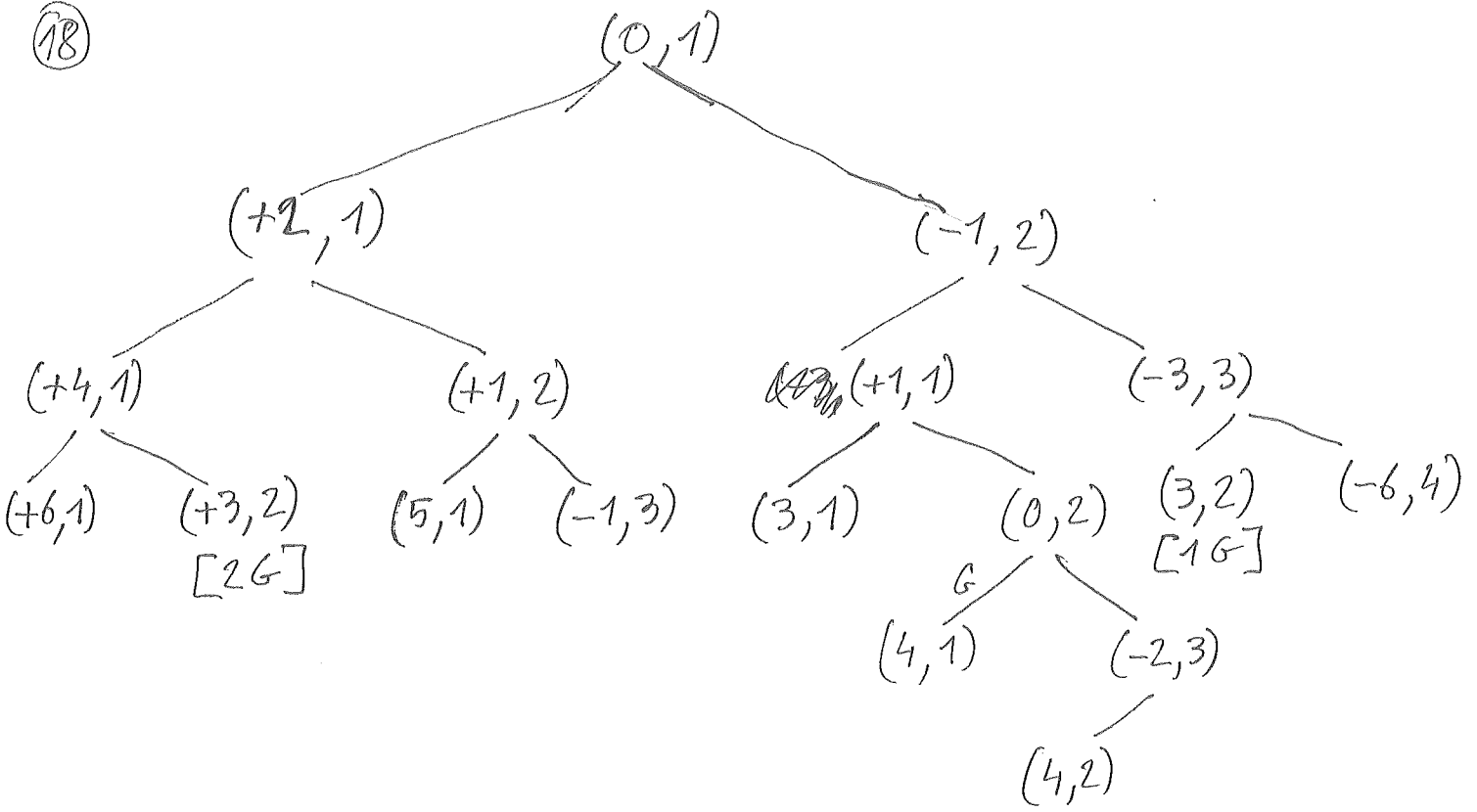
3, 4, 5, 6, 7

0, 1, 2, ~~3~~, 5, 11 (7)

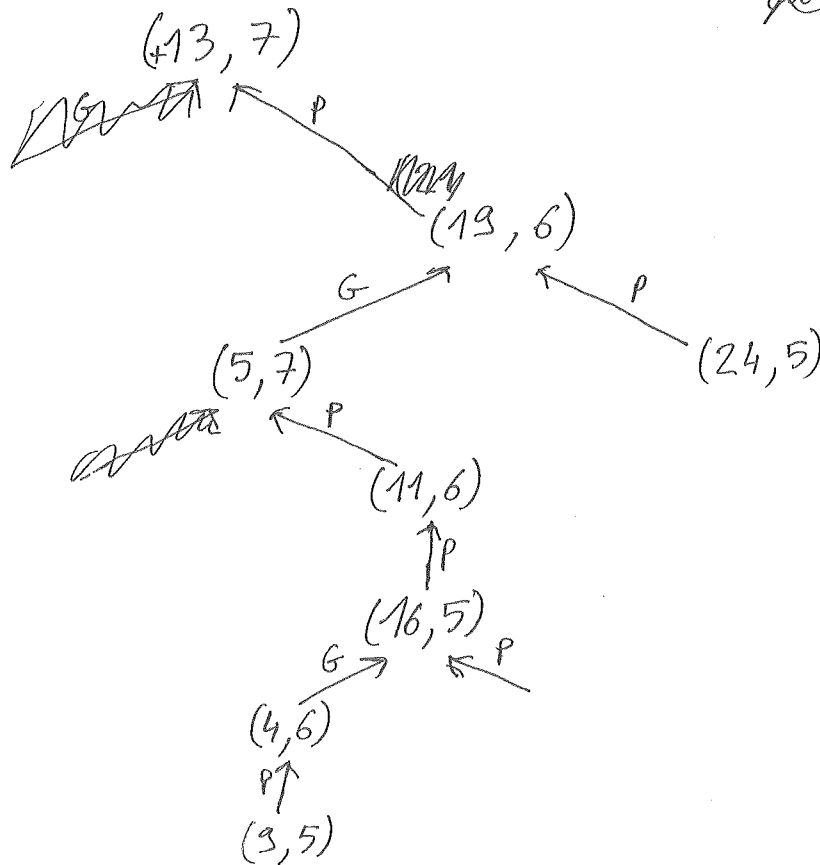
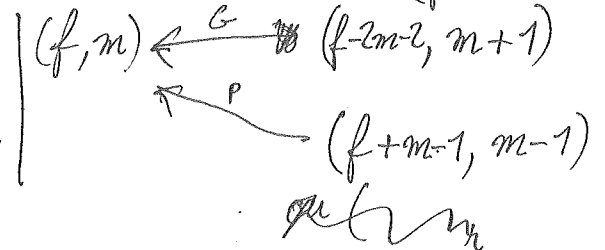
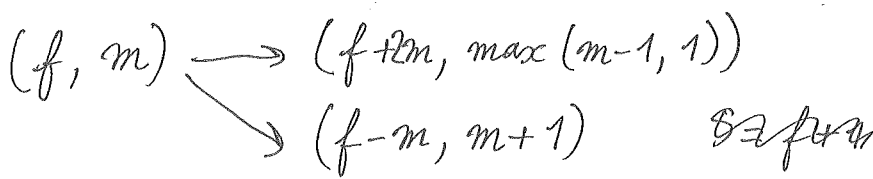
0, 1, 2, 3, ~~4~~, 7, 11

1 2 3 7 11  $\rightarrow S = \boxed{24}$

18



inverse:



6 ou 7 OK