Questien 1

(a)
$$28 = 7.4 = 7.2^2$$

$$\varphi(28) = 6.4.2 = 12$$

$$31^{123} = 31^3 [28]$$

$$34 = 3(28)$$

 $34^3 = 27(28)$

$$50 \quad 34^{123} = 27[28]$$

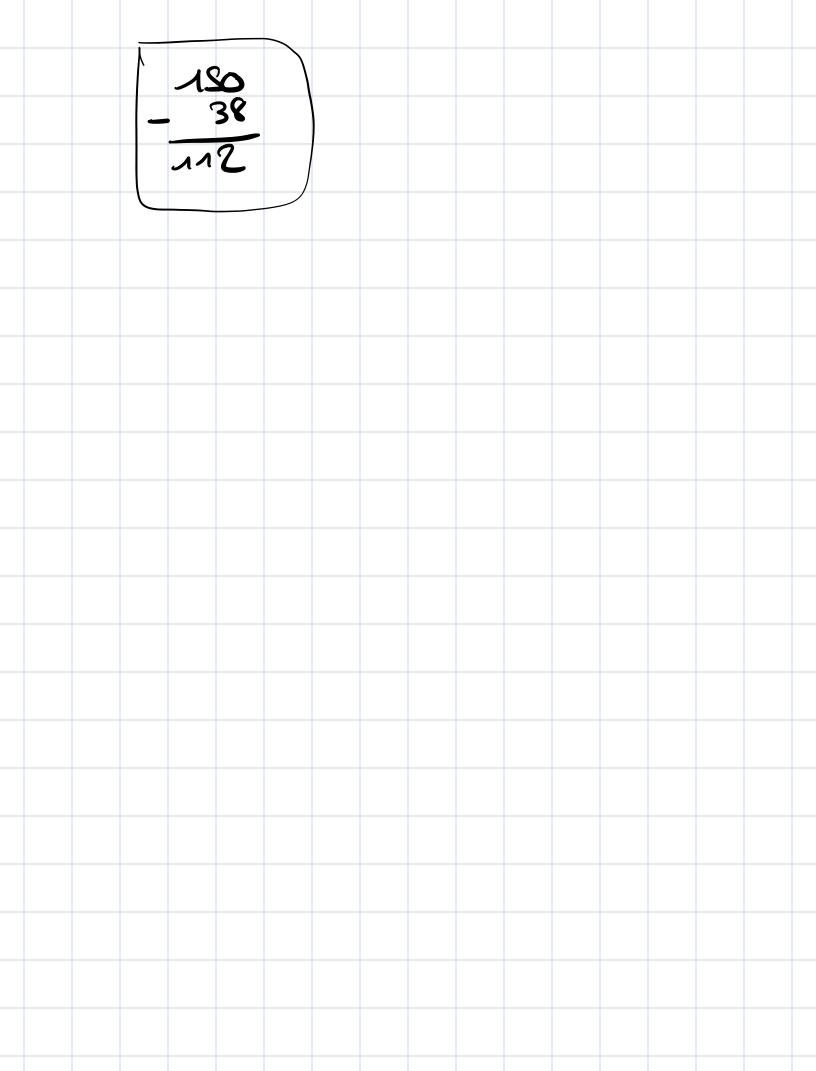
$$= -4[28]$$

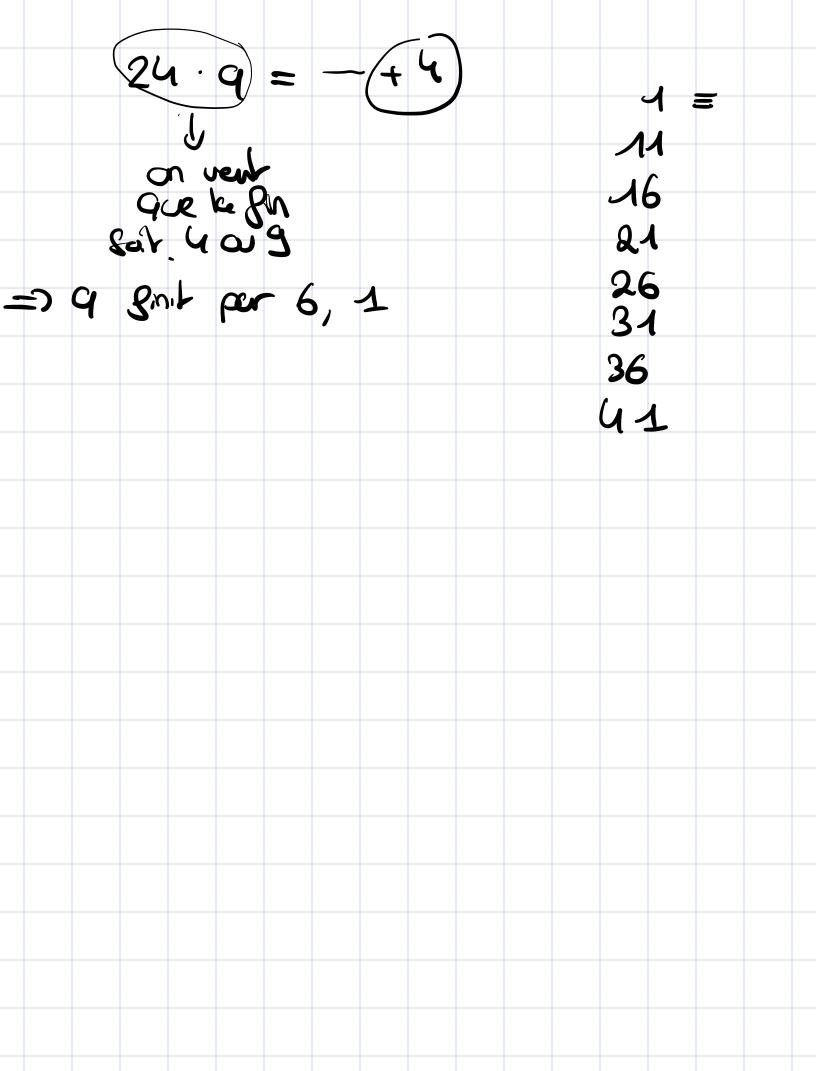
(a)
$$7-3+4-3+2 = 3-9+7$$
 $= 1$
 $1 = 1(11)$
 $10 = -1(11)$
 $10 = -1(11)$
 $10 = -1(11)$
 $10 = -1(11)$
 $10 = -1(11)$

Question 2 gcd(a,b) a=bq+ q gcd (70,51) 70=51.1+19 1 gcd (S1, 19) S1 = 18.2+13 2 gcd (19,13) 19 = 13.1+6 gcd(13,6) 13 = 6.2 + 1 2 gcd(6,1) 6 = 1.6 + 0 6 gcd(1,0) 1 = 0.0+10 on cherche $1 = 1 \cdot v + 0 \cdot v$ 1 = S1.3 + 19.(-8)= 153 + - 82-153 - 1S2 = 1

Quenu 3 01 10011 = k k' = (1, 1, 1, 0, 1)to cipher: 01001 prehime pad > an peut over toutres les dess

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(24]45 x = (4]45

=> [6] cs (4] cs x = (4] cs

=> [3] 45 (2] 45 [4] 45 = (4] 45

= (3)us (2)us = [1]us

 $\Rightarrow [6]_{45} = [1]_{45}$

modulo 45, danc il n'y a pao de solution oc