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西 Multiplicative Inverse of - x modulo 20: ⇒ We need to find or such that -7% =1 mod 20 3)far=1 (mod m), then x is the multiplicative invense of a modulo m. -> -7 = 13 (mod 20) Since -7=13 mod 20, we can new nite the congruence as 132 = 1 mod 20. > We are looking for an integer or such that 132 - 20k+1 for some integers k. We can test values of n: 野 n=1,13(1)=13 =1 mod 20 "早2=2,13(2)=26 =1 mod 26 if n=3, 13(3)=39 #1 mod 20 if n=4/13(4)=52=1 mod 20 if 91 = 5, 13(5) = 65 \$\frac{1}{2}\$ mod 20 if n = 6; 13(6) = 78 = 1 mod 20 if or =7, 13(x)= 91 = 11 mod 26 if or = 8, 13(8) = 104 = 4 mod 20 y = 9,  $13(9) = 117 = 17 \mod 20$ 100 = 100, 13(10) = 130 = 100 mod 20 $m = 11, 13(11) = 143 = 3 \mod 20$  $n = 12, 13(12) = 156 = 16 \mod 20$ 11 2 = 13, 13(13) = 169=9 mod 20

if x = 14,13(14) = 182 = 2 mod 20 1 n = 15, 13(15) = 195 = 15 mod 20 11 N = 16, 13(16) = 208 = 8 mod 20 n = 17, 13(17) = 221 = 1 mod 20

Thus, >c=17 is multiplicative invense of 13 modulo 20.

... The multiplieative invense of -7 1 modulo 20 is 17. in not trivipos

$$= (-1 \times 23) + 6$$

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* Multiplicative Inverse of -13 mod 230
> The multiplicative invense of a
number a mod m is a number or
such that: an = 1 mod m
In our case, we are looking for
 a number or such that:
     -132 = 1 mod 23
 To simplify, we finst convent
-13 into a positive numb equivalent
 -13 \mod 23 = -13 + 23 = 10
modulo 23.
 So, the equation become s:
          102 = 1 mod 23
 Now, we find the integer on suchthat
        10% =1 mod 23
 if ル=1,10×1=10=1 mod 23
ign = 2,10\times2 = 20 \neq 1 \mod 23
11 n = 3, 10x3 = 30 = 7 \mod 23
   n =4,10x4=40=17 mod23
    n = 5, 10 \times 5 = 50 = 4 \mod 23
    n = 6, 10x6 = 60 = 14 \mod 23
  n = 7, 10 \times 7 = 70 = 1 \mod 23
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We found it: 10.7=70=1 mod 23 since -13=10 mod 23 and 10 mod 23=7 we can clude —
The multiplicative invense of -13 mod 23 is X.

A C.Z POLL 1 (III 2881-To sampliffy, we strost. comme or of the opening solutions of the state modulo 23 : 13-42:5 : 10 -13 mod 23 = 13-42:5 : 10 : & amossad nothous salting! 5.0 MONY TE 3000 or Batul od A brist won a word CC FORM LE: NOOT はられることがのだ。エール・ライン 13 on = 2 10x2 = 20 = 1 mol: