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(1) Bazeout theorem poof and Example (inverse of

Bezout Theorem ; if a and b are positive integers, then there exist integers s and t such that 9cd (a,b) = sa+tb. where s and t are called ba. Bezout co-efficient of a and b.

finding the inverse of 101 mod 4620

.: 101 × = 1 mod 4620

101x+4620=1

Apply Euclidian Algorithm,

4620 = 45×101+75

101 = 75×1+206

 $75 = 29.26 \times 2 + 23$ 

26 = 23×1 + 3

23 = **3**3×7+2

3 = 2×1+1

S = 1x5+0

.. god (101, 4620) =1

By working Backword, 11 strates 11 partie of 1 2 Fiz poming eig 1 (1-3-1(23-7.3) =21.231+18.35/10 miles 1= -1.23 + 8 (26-1.23) = 18.26- 9.23 1= 8.26-9. (75-2.26) = -9.75+26.26 1= -9.75 + 26 (101-1.75) = 26.101 -35,75 1 = 26.101 - 35 (46.20 - 45.10) U 1 = -35.4620 - 1601.101 01 :, The inverse, 96 mpl mod 4620 is 1601 (1) chinese Remainder Theorem: epoletinonz .... nx be pairwise co-prime pintegers ( ocd (m, mi) = 1 for all iti) and let a, 292...ak be any integers. Then . The System of simultaneous Congrueencesic zmoon toil x = a, mod mn, RE az mod man x = ak mod nk

(11) Ferment Little Theorem: If p is prime and a is an integer not divisible by P. then a = 1 (mod P). Furthermore for every integer a we have stere and a mod B. ( - os = 1 Finding 7222 mod 11 DE - 101-05 = 1 By fermets little Theorem we know that, 710 = 1 (mod 11) - 08011 78 -The inversely. Bow) 61= 4(0) 4050 12 1001 thus 7222 22.10+2 (7.10)22 5 min -00 921 worked ad 3 m. = = (10) 34 + 49 an (iti 110 rd. 1= (in in) boe )= (1)22 149 2 10 10 your start of sile on the start of (11) Men . The System of simultaneous That means 2222 mod 11 =5 The poly is = De Cuzza: pour 20 = 30 IN pour ND = x