1. (a) gcd (132,84) = gcd (48,84) = gcd (48,36) = gcd (12,36)=1273 212 2 (5.X) 02 (b) because a. b. en ged (a. a+b) = ged (a, b) ~ sivening, evaluation of 2 evaluations because a, b are co-prime, so gcd(a,b)=1 = cases dasses = a,b are co-prime, so gcd(a,b)=1 2. (a) CA+B) *CA+B) = (AUB) + CAUB) = (CAUB)) = AUB TO W } = 12 (b) $A^{c} = (AUA)^{c} = A*A$ (O) ANB = ((ANB)) = (ACUB')= (ACUB')= (ACUB') = (ACUB') 3. (a) all possible function: (1) f(a)=0 f(b)=0 f(c)=0 (2) f(w)=0 f(b)=0 f(c)=1 (3) f(w)=0 f(b)=1 f(c)=0 (a) $f(\omega) = 0$ $f(\omega) = 1$ $f(\omega) = 1$ $f(\omega) = 0$ $f(\omega) = 0$ $f(\omega) = 1$ $f(\omega) = 1$ $f(\omega) = 1$ $f(\omega) = 1$ $f(\omega) = 1$ 1 fco=1 fco=1 (b) The 0.1 in co-domain represent the a,b,C in domain appear or in element of pow (fa,b,cg) (0) i) n^m
(1) 2^{mth} (2^m·2ⁿ) 4. (a) 2, aaa, aab, aba, abb, baa, bab, bba, bbb (b) (ii) (iii) (iv) are elements of R (b) Define $S \subseteq \mathbb{Z}^* \times \mathbb{Z}^*$ as follows = $(w,w') \in S$ if there is a $v \in \mathbb{Z}^*$ such that: either weEL and wiveL or wetL and wivel. O Reflexive: if (w,w) &s and w=w', so we have ,wvel, then wqel, or wv&l, then WVEL. So we proved that (w,w) es, we]T. So S is reflexive Symmetric (proveif (x,y) &s then (y,x) &s)
That is means that if there is a VEZ*, such that either XV\$L and yv&L or SO we have either ny &L and xNEL or nyEL and xVEL, too. therefore, we know that (y, WES, Sis Symmetric @ Transitive (should prove if (x,y) ESD, (U,Z) ES, when (x,Z) ES (Xy) ES => wither YVEZ*. eigher XVEL and YVEL or XVEL and YVEL (y.2) ES => YVED*, either yvEL and ZVEL or yVEL and ZVEL so we can get from above two that YVEIX, either XVEL and SVEL, or XVEL and ZVEL

SO (X.Z)ES, Sis transitive and by = (48,48) by = (48,48) by Becance S is reflexive, symmetric and transitive, sis equivalence relation.

Shave 3 equivalence dasses cd) S have $S_0 = \int w \in \mathbb{Z}^* \left[(ergth(w) mod 3 = 0 \right] = (dis) his = (dis)$ The firse one SI = I WEZ* length (w) mod; = 13 dUA) & WUA) = (0 x A) * (8 x A) Next one final one a) all possible function: 1 fewer febre 0=677 1= conf o= conf @ O=(A) T (B) feb=1 fev=0 0=607 0 1=607 1=607 1=60 f D 700)=0 0-007 1-(0)} 1=(1)7 0=(d)7 1-(w)+ (C) 0=01 1=wit 1=(m)+ 1) 1=607 1907 (b) The oil in co-densin represent the cipic in densin appear or not In element of pow (fab.ch) the coto (a) 2, asa, asb. aba, abb. baa, bab, bbn, bbb (b) (ii) (iv) are elevents of A (6) Orfine S C Z*XI* as follows = (w.w.) 68 if there is a ve I* such that: either NYEL and WireL or WYEL and WireL. Deflexive: if (MINDES and M=M, 39, Me have MAET they MET, OL MAET upon WYEL. So the pried that (wind) es. Well. 80 S is reflower winnets is proved to the it dure is a very such that other sight and give or JOYE L and BYEL IS We have either gretand knot or gretand aret, to trafer we know that the west, 873 Symetric 3 Transmire (standards of carp ES) (182) ES In Section (S (0.3) 65 = meter AAEZ, elder XAET and BACT or SAET and BAET in our firm who is the breeze, election and med and sier