

10	Oppg	gave 2.1)	
\$\frac{\alpha}{26} = \frac{\alpha}{26} = \frac			
2	0 =	200	
76 = 1000 and 221 = 76 × 200 and 3			
2. d. mode 16(2 n. 1)	C =	$t_{6} = m^{c} \mod n$	
2. d. mode 16(2 n. 1)			
2. d. mode 16(2 n. 1)	76	$\approx u^{269} \mod 221 \implies 76 \approx u^{269} \mod 13 \implies 11 = u^{269} \mod 3$	
2. of mode of 600 = 7 1. of 2 for 16 for 3 = 12 for 16 s 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 5 = 7 2. of a down 192 = 6 = 7 2. of a down 192 =			
P = (m/M ₁ -10 - 12 + 16 + 12) 269 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12 + 12) 289 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12) 280 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12) 280 d mod (12 = 1 = 2 + 12 + 12) 281 d mod (12 = 1 = 2 + 12 + 12) 282 d mod (12 = 1 = 2 + 12 + 12) 283 d mod (12 = 1 = 2 + 12 + 12) 284 d mod (12 = 1 = 2 + 12 + 12) 285 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12 + 12 + 12 + 12 +			
P = (m/M ₁ -10 - 12 + 16 + 12) 269 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12 + 12) 289 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12) 280 d mod (12 = 1 = 2 77 d mod (12 = 1 + 12) 280 d mod (12 = 1 = 2 + 12 + 12) 281 d mod (12 = 1 = 2 + 12 + 12) 282 d mod (12 = 1 = 2 + 12 + 12) 283 d mod (12 = 1 = 2 + 12 + 12) 284 d mod (12 = 1 = 2 + 12 + 12) 285 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 286 d mod (12 = 1 = 2 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12 + 12 + 12) 287 d mod (12 = 12 + 12 + 12 + 12 + 12 + 12 + 12 +			
264 d. wood 192 = 1 = 2 27 d. mod 192 = 1 265 192 = 37 × 2 + 32 27 = 34 × 2 + 1 1= 27 - 34 × 2 27 + 34 × 2 + 1 1= 27 - 34 × 2 27 + 34 × 2 + 2 27 + 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 + 32 27 - 34 × 2 + 32 27 - 34 ×			
EA. 1972 = 77 2 - 33 77 - 38 2 + 1 1= 77 - 38 2 2 77 - 68 - 77 2 2 2 77 - 68 - 77 2 2 2 78 - 68 - 77 2 2 3 78 - 68 - 77 2 2 3 78 - 68 - 78 2 78 - 68 - 78 3 2 78 - 78 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	φ =	$(g-1) \cdot (g-1) = [2 \cdot 16 \cdot 2 \cdot (92)]$	
EA. 1972 = 77 2 - 33 77 - 38 2 + 1 1= 77 - 38 2 2 77 - 68 - 77 2 2 2 77 - 68 - 77 2 2 2 78 - 68 - 77 2 2 3 78 - 68 - 77 2 2 3 78 - 68 - 78 2 78 - 68 - 78 3 2 78 - 78 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			
1972 = 72-2 - 38 37 = 36-2 - 1 1 = 77 - 31-2 2 = 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 74 - 10 2 75 - 162 2 - 72-9 2 75 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 4 76 - 762 2 - 72-9 4 76 - 762 2 - 72-9 4 77 - 762	269	d mod 192 = 1 => 77 d mod 192 = 1	
1972 = 72-2 - 38 37 = 36-2 - 1 1 = 77 - 31-2 2 = 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 73 - 162 2 - 72-9 2 74 - 10 2 75 - 162 2 - 72-9 2 75 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 2 76 - 162 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 3 76 - 762 2 - 72-9 4 76 - 762 2 - 72-9 4 76 - 762 2 - 72-9 4 77 - 762	E.A.		
77 = 38 × 4 / 1 = 27 - 38 × 2	192	= 72.1 + 38	
1 = 77 - 34.2 = 77 - (192 77 2) - 2 = 77 - (192 77 2) - 2 = 77 - (192 2 - 2) = 160 - 1 = 12			
= 77 - (192 7+3)-2 = 77 - 192 2 + 79-9 = 77 - 192 2 - 3 leter; and 192 so han objec 192 2 27-5 mod 192 = 1 = 2 sl-5 Un = c d mod u = 96 mod 22 (= (36) - 176) mod 22 1 36 = 36 mod 22 1 76 = (36) - 26 mod 22 1 36 = 36 mod 22 1 36 = 36 mod 22 1 36 = 36 mod 22 1 36 = (36) - 36 = 200 = (6 mod 22 1) 36 = (36) - 36 = 200 = (6 mod 22 1) 36 = (36) - 36 = 1216 = 111 mod 22 1 Un = 111 **Ppgave 2.2) W. (some systemat on Kangrumuni of 12 mod 22 1 4 x = 5 mod 9	T # F	VO 6 1 1	
= 77 - (192 7+3)-2 = 77 - 192 2 + 79-9 = 77 - 192 2 - 3 leter; and 192 so han objec 192 2 27-5 mod 192 = 1 = 2 sl-5 Un = c d mod u = 96 mod 22 (= (36) - 176) mod 22 1 36 = 36 mod 22 1 76 = (36) - 26 mod 22 1 36 = 36 mod 22 1 36 = 36 mod 22 1 36 = 36 mod 22 1 36 = (36) - 36 = 200 = (6 mod 22 1) 36 = (36) - 36 = 200 = (6 mod 22 1) 36 = (36) - 36 = 1216 = 111 mod 22 1 Un = 111 **Ppgave 2.2) W. (some systemat on Kangrumuni of 12 mod 22 1 4 x = 5 mod 9			
= 77 - 1922 + 1729 = 72.5 - 1922 Jeller: wood 192 så ka objek 1922 73.5 - wold 192 = 1 = 2 J = 5 192 = 6 mod s = 76 mod 221 = (36) = 175!			
27.5 - 192.2 - Jether: and 192 side know of spec 192.2 27.5 mid 192 = 1 = 2 J = 5 100 = 0 J mod 2 = 75 mod 221 28.5" - 190.5" mod 221 28.5" - 29.5" = 30 mod 221 28.5" - 30.5" = 30.5" = 30 mod 221 28.5" - 30.5" = 30.5	=	77-(192-77-2)-2	
27.5 - 192.2 - Jether: and 192 side know of spec 192.2 27.5 mid 192 = 1 = 2 J = 5 100 = 0 J mod 2 = 75 mod 221 28.5" - 190.5" mod 221 28.5" - 29.5" = 30 mod 221 28.5" - 30.5" = 30.5" = 30 mod 221 28.5" - 30.5" = 30.5	=	77 - 142.2 + 77.4	
27.5 and $ 92 = 1 = 7 = 5$ $ 91 = 3 = 75$ $ 92 = 1 = 75$ $ 93 = 76$ $ 94 = 36$ $ 96 = 76$ $ 96 = 76$ $ 96 = 37$	= ;	77.5 - 192.2 - 36/hrs: year 192 sa kay style 192.2	
$v_{11} = c^{\frac{1}{3}} \mod 1, = \frac{76^{\frac{5}{3}}}{(36)^{\frac{1}{3}} + (75)^{\frac{5}{3}}} \pmod{22}$ $= (36)^{\frac{1}{3}} + (75)^{\frac{5}{3}} \pmod{22}$ $= 76^{\frac{5}{3}} = 76 \pmod{22}$ $= 76^{\frac{5}{3}} = 30^{\frac{5}{3}} = 900 = \frac{1}{3} = 900 = \frac{1}{3$			
$v_{11} = c^{\frac{1}{3}} \mod 1, = \frac{76^{\frac{5}{3}}}{(36)^{\frac{1}{3}} + (75)^{\frac{5}{3}}} \pmod{22}$ $= (36)^{\frac{1}{3}} + (75)^{\frac{5}{3}} \pmod{22}$ $= 76^{\frac{5}{3}} = 76 \pmod{22}$ $= 76^{\frac{5}{3}} = 30^{\frac{5}{3}} = 900 = \frac{1}{3} = 900 = \frac{1}{3$	22		
$76' = 76$ $76' = 8976 = 30$ $76'' = (36)^{3} = 30^{2} = 30$ $76'' = (36)^{3} = 30^{2} = 30$ $76'' \cdot 76' = 16 \cdot 76 = 1216 = 111$ $1000000000000000000000000000000000$	77.	5 md d 1912 = 1 = 2 d = 3	
$76' = 76$ $76' = 8976 = 30$ $76'' = (36)^{3} = 30^{2} = 30$ $76'' = (36)^{3} = 30^{2} = 30$ $76'' \cdot 76' = 16 \cdot 76 = 1216 = 111$ $1000000000000000000000000000000000$			
$76' = 76 \text{mod } 221$ $76' = 576 = 30 \text{mod } 221$ $76'' = (36)^2 = 30^2 = 900 = (6 \text{mod } 221)$ $76'' \cdot 76' = 16 \cdot 76 = 1216 = 1[1] \text{mod } 221$ $100 = 1[1]$ 100	m =	$c^{d} \mod n = 76^{9} \mod 221$	
$76^{6} = $376 = 30 $		= (76) 4 + (76) mod 221	
$76^{6} = $376 = 30 $			
$76^{6} = $376 = 30 $		76' = 76 and 221	
$76^{9} \cdot 76^{1} = 16 \cdot 76 = 1216 = 111 \text{uncl} 221$ $v_{1} = 111$ $v_{2} = 111$ $v_{3} = 111$ $v_{4} = 111$ $v_{5} = 111$ $v_{5} = 111$ $v_{5} = 111$ $v_{6} = 1216 = 111$ $v_{6} = 121$ $v_{7} = 111$ $v_{7} = 111$ $v_{8} = $		$70^2 = 520^2 = 70$	
$76^{9} \cdot 76^{1} = 16 \cdot 76 = 1216 = 111 \text{uncl} 221$ $v_{1} = 111$ $v_{2} = 111$ $v_{3} = 111$ $v_{4} = 111$ $v_{5} = 111$ $v_{5} = 111$ $v_{5} = 111$ $v_{6} = 1216 = 111$ $v_{6} = 121$ $v_{7} = 111$ $v_{7} = 111$ $v_{8} = $		$\frac{10}{2} = \frac{10}{2} = \frac{30}{2} $	
Pppgave 2.2) Vi losser systemat on tengramone: $4x \equiv 5 \mod 9$ $2x \equiv -1 \mod 7$ $2x \equiv 6 \mod 7$ For a losse systemat ini vi gjane $4x \otimes 5x \otimes 2x \otimes 6x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7$		76 (96) - 30 - 900 = 16 mod 221	
Pppgave 2.2) Vi losser systemat on tengramone: $4x \equiv 5 \mod 9$ $2x \equiv -1 \mod 7$ $2x \equiv 6 \mod 7$ For a losse systemat ini vi gjane $4x \otimes 5x \otimes 2x \otimes 6x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7x \otimes 7$			
Pppgave 2.2) V: loser systemat on kongressere: $4x \equiv S \mod 9$ $2x \equiv -1 \mod 7$ $2x \equiv G \mod 7$ For a lose systemat mic vi giane $4x \otimes 2x$ on til locae $x \otimes 5x$. Do wie vi finne den invese ved hjelp an E.A.: $9 = 2.4 + 1 \mod 7$ $1 = 7 - 2.3$		76 · 76 = 16 - 76 = 1216 = 111 und 221	
Pppgave 2.2) V: loser systemat on kongressere: $4x \equiv S \mod 9$ $2x \equiv -1 \mod 7$ $2x \equiv G \mod 7$ For a lose systemat mic vi giane $4x \otimes 2x$ on til locae $x \otimes 5x$. Do wie vi finne den invese ved hjelp an E.A.: $9 = 2.4 + 1 \mod 7$ $1 = 7 - 2.3$			
Pppgave 2.2) V: loser systemat on kongressere: $4x \equiv S \mod 9$ $2x \equiv -1 \mod 7$ $2x \equiv G \mod 7$ For a lose systemat mic vi giane $4x \otimes 2x$ on til locae $x \otimes 5x$. Do wie vi finne den invese ved hjelp an E.A.: $9 = 2.4 + 1 \mod 7$ $1 = 7 - 2.3$			
Vi loser systemet on Kongruensene: $4x = 5 \mod 9$ $2x = 1 \mod 7$ $2x = 6 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ $4x = 5 \mod 9$ $4x = 5 \mod 9$ $4x = 5 \mod 7$ $4x = 6 \mod 7$			
Vi loser systemet on Kongruensene: $4x = 5 \mod 9$ $2x = 1 \mod 7$ $2x = 6 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ $4x = 5 \mod 9$ $4x = 5 \mod 9$ $4x = 5 \mod 7$ $4x = 6 \mod 7$			
Vi loser systemet on Kongruensene: $4x = 5 \mod 9$ $2x = 1 \mod 7$ $2x = 6 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ For a lose systemet mi vi gjære $4x \otimes 2x \otimes 1$ $4x = 5 \mod 7$ $4x = 5 \mod 9$ $4x = 5 \mod 9$ $4x = 5 \mod 7$ $4x = 6 \mod 7$		nava o o)	
For a lose systemet mi vi gjøre 4x og 2x om til lovre x og x. Da mi vi finne den innese ved hjelp av E.A.: 9 = 2.4 + 1 1 = 9 - 2.4 1 = 7 - 2.3	bbá	gave 2.2)	
For a lose systemet mi vi gjøre 4x og 2x om til lovre x og x. Da mi vi finne den innese ved hjelp av E.A.: 9 = 2.4 + 1 1 = 9 - 2.4 1 = 7 - 2.3	V: (osar systemat au Kongreensene:	
For a lose systemet mi vi gjøre 4x og 2x om til lovre x og x. Da mi vi finne den innese ved hjelp av E.A.: 9 = 2.4 + 1 1 = 9 - 2.4 1 = 7 - 2.3	4 x	= S mad 9 = 4x = S mod 9	
For a lose systemet mi vi gjøre 4x og 2x om til lovre x og x. Da mi vi finne den innese ved hjelp av E.A.: 9 = 2.4 + 1 1 = 9 - 2.4 1 = 7 - 2.3	2x	= 1 mod 7 2x = 6 mod 7	
1 lowe x 05 x. Do mi vi fine den invese ved hjelp av E.A.: 9 = 2.4 + 7 = 2.3 + 1 = 7 - 2.3			
1 lowe x 05 x. Do mi vi fine den invese ved hjelp av E.A.: 9 = 2.4 + 7 = 2.3 + 1 = 7 - 2.3	F		
9 = 2.4 + 1 $1 = 9 - 2.4$ $1 = 7 - 2.3$	100	6 1056 2661cmc1 mo VI gjar IX 05 FX OM	
1=9-2.4	til	loure X OS X. No me vi time den invese ve d'hjelp av E.H.	
1=9-2.4			
1 = 9 - 2.4 $1 = 7 - 2.3$ -2 or invers $f:1 4x$ -2 or invers $f:1 2x$	4 =	2.4 + 7 = 2.3 + 1	
-2 cr invers fil 4x -2 er invers til 2x	=	9-2-4 1 1=7-2-3	
		(x invers til 4x -2 ex invers til 2x	

111 46	<u>, </u>														
Don for v: -2.4x=-2.5	Kongruersene		-2.	2~	= /-))-(-2	(mo	12			_			
-8 = 10	mod 1					アじ 4	-)		17					+++	
-8 = 10 -10 = 8	19		0	= 9	1			mo						+++	
10 - 8	Mod 1		1	- 1				mo	d 7					+++	
10 - 0	1.6			. ,	5			17							
X = -10 = 8	med 9		又三	-4=	3	$\overline{}$	mo	19 7				_		+	
		,												-	
Vi jobber a	è med syste	met												1	
X = a mod m		x = 6 1	mos	In										\perp	
X = 8 mod 9		x = 3	mod	7											
GCD(m,n) =	GCD(7,9) = 1														
n 1 /	77 //	4												+++	
Pet finnes a															
	mod m nv													-	
mu =	mod n nv	=0 mod v	1										-	+	
														44	
Vi firmer c	ved:														
c= a.u.v -	+ 6 m.u														
Finner vog u	. Vh.a. E.	A. 00 7	, q											\top	
7.v + 9.u = 1	0.00		<i>7</i>												
7.4 +9.(-3) = 1	1 0 1, 4	- n = -2	,											1	
1-1 (10)		03 W)												+ +	
874,	2 0 (1)													+++	
c=8.7.4 +														+++	
= 224 + (-5	31													+++	
- 143												_		-	
	0 1		-											_	
Vi vet fra		x = C (v	10 g n	1,,)											
X = 143	modzia														
x = 143 x = 143	mades														
x=17	mod cz														
Sichker 13	7 med asis:	calle Courses	ilms to												
4.17=68	= C mod C	7 9.	17 =	- 24	5 -	- 1	10-01	7							
Sjokker 17 4.17 = 68 9.7+	5 26 60.16	7		2.501	Ξ,	- 1	,,	7							
174	2 ,) m97		7	U		1	vhoc								
	- (3)	1 1.					_								
(1 .	- 17 Wiser	besse F	rongr	verse	lul	OC	- Cr	40	7						
Ser at x	1 1/	1107 7100	+:\+	trid so	t;llw	50	;sten	v()							
Ser at x det minote	positive helto	alle Over			1 1										
det vinota	partive helto			1			,								
det vinote	partive helto		f	1	all	, c	106n;	yer							
Ser at x det minote	positive helto		f.	1	all	اد	106n;	iger							
det vinota	positive helto		t.	1	all	<i>(</i>	losn:	ver							
det vinota	positive helto		+ .	1	all	(<u>.</u>	loen;	izer							
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det vinota	positive helto		+ +.	1	all	/c	10sn;	nger							
det minote	positive helto		+	1	all	(c	losni	nger							
det minote	positive helto		+.		all	(c	losni	uger							

ppgave 3										
$n = \ell_X \in i$	2:14x 4n3	_								
f: [2022] -	-> [1011] red	f(x)=9	h.b.h.	x≡y i	nod 104					
1 001	V (. 1								
Løser t(x)=y	for Scsitte ver	diene til x	. :							
1(1) = 7	siden 1≡1	mod 1011								_
f(2) = L	siden $2=2$	nod 1011								_
t(1011) = 0 s	iden 1011 = 0	mod 1011								_
#(2022) = O 5	Iden 2022 = 0	mod 1011								
ppgave 3	1.2) nen finjekt:v?									
Lr Tunnksjon	injektiv, sier d	, 10	1 0	G 1						
			al tor	x, y = 11						+
05 X # 9 11	mpliser det at f	(x) = 1(g).								
11	jon kan vi toot	1 1	1012							7
1 \$ 1117	uen f(1) = f(1)	e mea 1	05 1016.							
5.1.0	1 mod 1011	.012)								
0,2 [N2 =	nod (01)									
V: 600 ola	at fikke e	- inickfu								
V 34 Q6	41 1746 4	Tage 150 .	(2)							
ppgave 3	.3)									
	n f surjektiv	?								
Etter dofini	sjan er en fi	Unksios fil	f~B s	orickt:v	hv.s					
det for a	lle y ∈ B, f:nn	es en XE	A slik	at f(x	= y.					
I vir funka	jon vil da f	For alle 1	n∈ [(oli],	figues	en xE [2	022)				
slik at			,							
Lí .	10.11	0	lau							
	1011 Finnes		x = 1011	Siden						
	0) +(1011) = [0[]									
-	, h.b.h x = y	mo31011	وه							+
	nod 1011 os									
1011 = 1011 V	hod 1011.									
V	.1 () , ,	: + [0.0-0	2 . (1 1 14 00	4 4 2					
	Jefinisjons om	na del 1222	-Jer do	,600011 34	8 m S00	n				
Verdiouradet		. (,)	P(<1)		1	Llav				
	2022) 05 46									
$\int a tor uvc$ $f(1) = f(1012)$	- y finnes d	PT L X	30m 10	over two	Sjan M. t.	2/45				
										\dashv
f(10) = f(1021)										
f(1011) = f(2092)=()									
\f. , 1	A 4	r l	. 1.1							_
V. Konklud	eer med at	1 es	surjektiv,							
				W						_

Oppgave 3.4)			
Definação en relacjon R: [1011] -> [2022	17 \md (√u) € R		
h.b.h. X ≡ y mod 2022	1 1000 (11,9)		
Er relazionen R en Ponksjon?			
Lr relazionin L in Tourision:			
(x,y) = R betyr at XECIOID og	6[2027]	1	
(x,y) 9 30 yr a (CLIVII) 02	, y L2062 , 30m v. Fan 1	strive sons XIIG.	
Kravet or at x = y mod 2022.			
Altsa vil feks.:			
(1,1) ∈ R siden [=1 mod 2022			
(1,2) ∉R siden 1 ≠ 2 mod 2022			
10. 4 0. 10. 0	1 / 11 / 1 - 12		
Vi vet fra definisjon av funksjon			
er "settet ov ordnet parr (a,b) slik at			
av AxB, er det en relavjon fra A	til S. Dette tilsier ossa at		
hurt element; A er startelementet; noge	aktis ett pur.		
Vi kon aeroette dette til var funk			
V; Nor f: (2022) -> [101] ved -			
Rolavionen R: [1011] -> [2022] ved (x,y) EF			
er en funksjon siden hvert element i [101]	e ikke at start punkt i		
nogaktis ett parr. Vi sjekker!			
x=1, 1=1 mod 2022			
(1,1) c et par			
x=(01) (01) = (011 mod 2022			
(101, 1011) er et par.			
Konkludeer med at velagionen Re	er en funksjon.		
Oppgave 4.1)			
La A vore en mensde os la < vo	re en partiell ordning på A.		
Sier at « e rettet huis for alle a			
medlem c : A slik at a c og b x			
(< e vettet) → (ta, b ∈ A) (3c ∈ A) (asc v psc)		
+++++++++++++++++++++++++++++++++++++++			

	5.1)										
$n \in \mathbb{Z}^{+}$											
$(\forall n \in \mathbb{Z}^t)$ (1.((1!)+2·(2!) ++ n·(n!) = (n+1)!	-1)									
P(n) = 1·(1!)+2	(2!) ++ n·(n!) = (n+1)! -1										
Basiostes:	P(1) = 1.(1!) = (1.1)!-1	20 V									
	P(3) = 1.(1!) + 2.(2!) + 3(3!) = (3	+1):-1									
	= 1 + 4 + 18 = 24-1										
	= 23 = 23 /										
Indukcions ster:	Anta of P(K) = 1.(1!).	+ 2.(2!) + + k.(K!)	=(k+1)! - 1								
	er sent for en vilk										
	1·(7!) * 2(2!) * * k(k!)) + (K+1)((K+1)!) = ((ka) (1) -	1							
	1.(1!) + 2.(2!) + + 15(K!)										
	(K+1)!-1 + (K+1) ((K+1)!)	i i i i i i i i i i i i i i i i i i i	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
	(K+1)! + (k+1)((K+1)!) -										
	(1+(k+1)) · ((k-1)!) -1=										
	$(k+2) \cdot ((k+1)!) - 1 = (k+2)!$										
	$(k+2) \cdot ((k+1)!) - 1 = (k+2) \cdot ($										
	(K+2) · ((K+1).)] · (K+2) · (K41);)									
	Vi sv at besse		I. C	DCI. 4	1						
					/ 05						
	Kukluder med at	pastonder e	er sanv	1.							
Huer mange	5-tuples ov pusitive	heltoll (x,x,x,x	, Xu, 150)	orefyll.	γ ×, +×	2 + x3 + x4 +	x _s = (0 ²				
Siden det	S-fupler ou positive er tupler vet vi at	rekke folsen	oi Jalles	opfyll.	r x, +x k7:5 , 0	2 + × 4 × 4 + × 4 + × 5 at sa	x _s = (0 ? none tol)				
Huer mange Siden det Kan forekon	S-tupler or positive en tupler vet vi at unue; typelen fler ga	rekke folsen ,	oi talles	er vi	K7:5 , 0	s at sa	more toll				
Huer mange Siden det Kan forekon	S-fupler ou positive er tupler vet vi at	rekke folsen ,	oi talles	er vi	K7:5 , 0	s at sa	more toll				
Huer mange Siden det Ken forekon Vi se pi	S-tupler or positive er tupler vet vi at mme i tupler Alere 30 unlisheter, og legger	rekke folsen, ng. f:) anto H	oi talles uvligh	er vi	k4:5 , 0	s at so	nose toll				
Huer mange Siden det Ken forekon Vi se pi	S-tupler or positive en tupler vot vi at une; tupler flue so unlisheter, ag legger, a,0,0,0,0) - 5 = 5 5 = 1	t rekke folses , ing. +:) antold (5,2,1,1,1) -5.L	oi talles unligh	er vieter 3 =	in 01	s at so	more tol) "" = 30				
Hlar mange Siden det Kan forekon Vi se pi 10 = (10,	S-tupler or positive en tupler vet vi at unne: tupelen flere ga undisheter, og lægse, 0,0,0,0) - 5 = 5 5 = 1	rekke folsen, ins. f:) anto H (5,2,1,1,1) -5.L (5,2,2,1,0) -5.1	pi talles 1 = 20 1 = 60	er vieter 3 =	(3,3,2,1, (3,2,2,2,	s at som	nose tol) n' = 30 = 20				
Huer mange Siden det Ken forekon V; se pi	S-tupler or positive en tupler vet vi at vine; tupler flere so unlisheder, ag legger, a,0,0,0,0, -5=5 5=1,0,0,0,0,0,-5:4=20	(5,2,1,1,0) -5.1 (5,3,1,1,0) -5.1	nulish 1 = 20 12 = 60 2 = 60	er vieter 3 =	(3,3,2,1, (3,2,2,2,	s at so	nose tol) n' = 30 = 20				
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