FIT =) R[x]  $\xrightarrow{\sim} \varphi(R[x]) = C$ 2. a) Q: Z - R  $\varphi(m) = \left( \begin{array}{c} 0 & m = 0 \\ \hline 1 & 1 \\ \hline \end{array} \right)$ 1-(|7/7-11) M<0. Write ker ()= (n), 17/0. b) FIT = 1 Z/AZ = PR integral domain = 1 Z/AZ = 1 integral domain = 1 A=U or P, Z[i] = (a+bi | a, b & Z') C C Subring  $Z = Q(\Lambda) = \Lambda + (3+4i)$ Q swjertive: Required to prove : give x+iy & Z[i], 7 AFZ s.t. i.e. string =  $\Lambda + (a+b_i)(3+4_i)$ , some  $\Lambda \in \mathbb{Z}$ .  $= (\Lambda + 3a-4b) + i(4a+3b)$ 7 solution to y = 4a+3b (because gcd(4,3) = 1) Then can change a so that x = 1 + 3a - 4b.  $\ker Q = \frac{2}{4}$   $\Lambda \in \ker Q \iff \Lambda = (a+bi)\cdot (3+4i)$ , some  $a,b \in \mathbb{Z}$ = (3q-46) + i (4a+36)

AR MANAGER FERRENING BALLANG REVERONMENT CONTROL CONTR	i.a., 4a+3b=0 =1 a=3k, b=-4k, some keZ
CONTINUE AND	$4  \Lambda = 3a - 4b = 9k + 16k = 25k$
	$ke_{0} = (2s) = Z$ .
	Fi7 =, $Z_{1} \xrightarrow{-} ZLi]_{(3,4;)}$
	(3.4;)
4	a. $F:R \rightarrow R$ , $F[a] = g^{\dagger}$
	F(1)=1
	F(ab) = Flat F16) / (R commutative!)
	$F(a+b) \stackrel{?}{=} F(a) + F(b)$
	$(a+b)^{p} = \sum_{i=1}^{p} (i)^{p} a^{i} b^{-i}$
	B.T. i=0
	$= \lambda (a+b)^{2} = (a+b)^{2} = (a+b)^{2} = a^{2} + b^{2}$
	because "p=0" in R"
	I nave carefully, $\varphi(p) = 0$ where $\psi: \mathbb{Z} \longrightarrow \mathbb{R}$
	is the my how of QZ.
A STATE OF THE STA	And when we write n.a for n=72 4 aff,
	we mean $\varphi(n) \cdot q = /444 - + \alpha                               $
comes a metallo est encia 3 (1221/09/20-de), a labela (1994/2014/17) 4 (1906-), a que la esta (1906/2014/2014/	) °
igga gaffaraga e sleicht in de Politic 20 von de Stade d	[-(a+··+a) 1<0.
AMERICAN COLUMN (C. 1974) PROCESS TO STATE OF THE COLUMN C	
nggar ti di La (Kill) i Mark (B.D) ( India) a Primada ( Ana Markel (1964))	b. R=(7/pz/ [x]

 $F:R\rightarrow R$ ,  $F(t) = F(T_{a_i}x_i) = \sum F(a_ix_i) = \sum a_i(x_i)^P \rightarrow$ 

```
b. P. CEXY7 -> CEH
                                Q(f(x,y)) = g(f^2, f(f^2))
                        \eta^2 \mapsto t^2(t_2^{-1})^2 \leftarrow (x+1) x^2
            : (= y2 - x2 (x+1) E ker ().
                   (lain: kr ()= (f).
                   Proof: Sinilar to (a), give g & ker ()
                                           write q=qf+r, r=0 or degr< degf=2.
                                \Gamma = a_0|x| + a_1|x| \cdot y
= a_0|x| + a_1|x| + a_1|x| \cdot y
= a_0|x| + a_1|x| + a_1
                                  0 = -(+2), + (+2)) = a_0(+2) + a_1(+2) + (+2)
                                  = q_0(f^2-1) = q_1(f^2-1) = 0
                                     = 1 a_0(x) = q_1(x) = 0. = 1 r = 0. q_1
                   \varphi(q(x,y)) = \sum_{\alpha_{ij}} (\{z_i\}^{i+j}, t^j)
                       (lan: p(C[x,y]) = { h & C[+7] | h(1) = h(-1);
                       Pred: C = Q(q) = q_0 + (f^2-1) \cdot q, some q \in C[t]
                                                      \geq (arready given he RHS,
write h = \chi+ (f<sup>2</sup>-1). q, \chi \in (\chi= h(1)=h(-1)
                                                                                                                                                                                        q e ([t]
                                                                        Observe t^{2k}(t^{2}-1) = \varphi((x+1)^{k} \cdot x)
```

6.	a. a, b e N.
	$a^{\Lambda}=0$ , $b^{\Lambda}=0$ .
	$= \sum_{i=1}^{n} (a+b)^{n+m} = \sum_{i=1}^{n} (a+b)^{n+m} = 0$
	$a^{\Lambda} = 0,  b^{\Lambda} = 0.$ $\Rightarrow (a+b)^{\Lambda+\Lambda} = \sum_{i=0}^{\Lambda+\Lambda} a_i b^{\Lambda+\Lambda-i} = 0$ $BT.  i=0$
	i.e. $a_ib\in N=1$ and $b\in N$ .
	UEN/ aEN, DER => ba EN / (Rigmoutative!)
	= N ideal.
	Tremak: Recall, say I-R is an ideal of a stage R if
	1. $(J,+) \subset (R,+)$ is a subgroup
	2. at 1, ber =1 bat.
	Nation that it suffices for 1. to check OFI 4 I is
	doed unde addition, because additive inveses exist in I by
	$2: -\alpha = (-1) \cdot \alpha \in I.$
	b. Whe $\bar{a} = a + N \in R_N$
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	Suppose $\overline{a}^{n}=0$ . i.e. $a^{n}\in\mathbb{N}$ .
	$7he  (a^{\Lambda})^{\Lambda} = 0 , \text{ some } \Lambda.$
	i.e. $anm = 0$ , $a \in \mathbb{N}$ , $\overline{a} = 0$ . $\Box$
7.	a) ( Ideals of 2/12 ) (ideals of 2 containing 12=(n)
	1 1 1 1
	< (d)   d n;
	I/NE I "d divides a"
	172
	3 -> 9'3 9:2-12/12.
	aucher has

	See, under this correspondence
Auto and Automatical State of the State of t	(Maximal ideals of Z/12) + / Maximal ideals of Z/
month and design the Charles of the Charles and the Charles an	containing (n)
HTELETERAL AND THE CONTRACT CO	
4 Para - 1900 in 13 pai, 17 in 27 in 23 in 24 in 25 in 24 in 25 in 2	(7)   ppme, pln's.
ada <del>de</del> Canal. Aj encona 2 minoras en 140 de capacidado apresidade as senera lague en gran de de	: 2/7 lad <= 1 N = pd , p prove, x EN.
(16. д. 16° 44) (16. д. 16° 45)	
A MAN Sand C. C. C. C. S. S. S. C.	b. Note first: $3 u \in R$ is a unit $(=) u = R$ .
<del>ni, an mark (Bill (2003) Bill (Bill (Bill</del>	In particular, if I = R ideal, u unit = > u & I.
# N. P. A. A. Onder S. C. M. P. S. A. S. S. A. V. C. S. On S. B. C. O. On C. C. On C. C. S. C. C. S. A. P. J. A	
ne del 2 des fais de La de 2 des fauta La de 200 de 20	So, in our case R' = {ueR   u mity   CRIM.
, provide (c.g., 1, 1, 1), Shibalan Me - generatura (d. 1900, and mercumulata (1900) and december (c. 1), 2, 2, 3, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,	Converdy, suppare a ERM.
	I (a) = R Ke a is a wit
230 Alaring (1964 Al ETIS) - 820 4 (20) 565 Came Laure (20) (1964 Al Anno 27) - 28	Otherwise, I maximal ideal M'>(a).
netzgalandet umzeneg general eta eta 1880 en 190-eta 1880 eta 1880 eta 1880 eta 1880 eta 1880 eta 1880 eta 188	
an Palantin da disambat di Palantin da Palantin di Palantin da Palantin da Palantin da Palantin da Palantin da	$R_{+} = M',  a \notin M \times M$ $= M' \neq M$
A ARTHUR CLAMP (A APP TO CLAMPA) (A LO ) ON ARTHUR CLAMPA (A APP CLAMPA) (A APP CLAMPA) (A APP CLAMPA) (A APP C	.: R*= R\M.
ar (Philippo d'Amidian in Amidian de La Carlo Ca	<b>c.</b>
e Elifologo en 114 de 19 mandre Richard Medines I.a.o critici el 24 de 24 de 25 meteorio El den 127 à 184 de	Ring, ICR, RII CR*.
3.944-840.036.73.151.036.036.63.43.43.43.43.43.43.43.43.44.44.44.45.13.44.45.13.44.45.13.44.45.13.44.45.13.44.	7
- Standard Company and Assay (Assay) Assay (Assay) Assay (Assay (	The, if $J \subseteq R$ , $J \cap R^* = \emptyset = \gamma$ $J \subset I$ .
(Kanasa (A.) ka dana da kada ka kada (A.) (Ka da da da da da da kada (A.) ka kada (A.) (Ka da da da da da da d	The, if $J \subseteq R$ , $J \wedge R^* = \emptyset = \gamma  J \subset I$ . So $I$ is/maximal/of $R$ , $R$ local. $\Pi$
rt deur das er næ slæft har fre stransen dal de sommen kannen skreve fre stret bekend	ideal
8.	a. Suffices to shar that every f E CLEXII \((x)\) is a unit
	(by 67c.)
acon temperatural del della	We have $f = a_0 + a_1 \times + a_2 \times^7 + \cdots$ $d_0 \neq 0$ .
•	Let 9= 6, x + 6, x + 6, x + 6, x + 6 ([[x]]
	He fa = 90 + (96, +96)x + (905, + 96, + 926)x +

The state of the s	
	See we can solve $fg = 1$ for coefficients by inductively:
	$q_{0}b_{0}=1=; \qquad b_{0}=q_{0}^{-1}$
	$a_0b_1 + a_1b_0 = 0 = 0$ $b_1 = a_0^{-1}(-a_1b_0)$
	et.
	Thus fis a mit, as required.
	b. (learly ([[x]] < (((x)) \left ([[x]]
	Required to prave (((x1) = \( \int \( \text{L[x]]} \)
	are dy & of CCC x II
	9
	we may write $g = x^n \cdot u$ , u unit, by a. (units are power)
	The $f = \int u^{-1} \in \mathbb{C}((x))$ . Soils $\frac{1}{x}$ and $\frac{1}{x}$
	g and tem.
9.	$a+b\sqrt{3} = (a+b\sqrt{3}) \cdot (c-d\sqrt{3}) = (a(-3bd) + (bc-ad)\sqrt{3}$
	(+dJ3/R (2-3d2 (2-3d2)
	= ) F = of R spaned as OX yester space by 1 4 J3
	Also 1453 linearly independent over (53 : trational)
	=> 1,53 basis of F over Ox.
	T NB C=3d2 + 0
	Lecauxe 53 : Mational.
>	