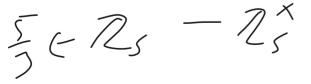
Localization

Wednesday, November 11 is a University holiday. On that day:

- No lecture or morning office hours.
- Evening office hours will meet as usual. $(8 9 \mu) (57 = 0) (-8)$

Localization in the rational integers: S-units

S= finde set of prime numbers (eg. {2,3}) Bilder aber, bonkydinicklypmer Saling RERSER Singers S-units = units in 25 = { 9 FOR 9, and driss (P.S. ± 2'3' i, ER)



The S-unit theorem There The equation X My = 1 has only Knitely may solution sim S-mits. (May prosts of this, alsorthans) (sage Math has a solve) JH - Z) = 19+1-8-2 $\frac{3}{2} + \frac{-1}{2} = 1$

Localization in the rational integers: at a single prime

P=pnm $Z_{(p)} \sim \langle \frac{\alpha}{6} \in \mathbb{R}; \alpha \in \mathbb{R} \qquad 6 \ \text{of } N.S. (b) \\ \langle \frac{\alpha}{6} \in \mathbb{R}; 6 \in \mathbb{R} - \langle \sigma \rangle \qquad b \neq \gamma$ $(p) \subset \mathbb{R}_{(p)} \longrightarrow \mathbb{F}_p$ and ideals in this may prime inpution, Ripisa discrete valationing

Localizations of integral domains

A = integral Amain $K = Frac A = <math>\left\{ \begin{array}{c} a \\ 6 \end{array} \right\} \left\{ \begin{array}{c} a \\ c \\ c \\ c \end{array} \right\} \left\{ \begin{array}{c} a \\ c \\ c \end{array} \right\} \left\{ \begin{array}{c} a \\ c \\ c \end{array} \right\} \left\{ \begin{array}{c} a \end{array} \right\} \left\{ \begin{array}{c} a \\ c \end{array} \right\} \left\{ \begin{array}{c} a \\ c \end{array} \right\} \left\{ \begin{array}{c} a \\ c \end{array} \right\} \left\{ \begin{array}{c} a \end{array} \right\} \left\{ \begin{array}{c} a \end{array} \right\} \left\{ \begin{array}{c} a \end{array} \right\} \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \end{array} \right\} \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \end{array} \right\} \left\{ \left\{ \begin{array} c \\ c \end{array} \right\} \left\{ \left\{ \begin{array} c \end{array} \right\} \left\{ \left\{ \end{array}$ Note: if A rot < PID, g~f (=) a d=b(. the "lovest tems" may not make sente. containing 1 and lets be a sheet of A-{a} clice Aunde multiplication. Defre StAFAS = { EK: acA, 6ES] This i's ing and A -> stais injichne es-S-(1), S'A=A; S=A-(03, S'A=K.

Localization at a prime ideal

A= integral Amain p=pnme ideal notes = A - f is multiplicative A = R, f=(p)) detre Ag = 5 A. (P.S. Ag = R.) prop this is a local mas EAR (regider Kerd is Frac (A/P)) For any or here inter , A = A = (FA)

prop ingener, prove deals **Discrete valuation rings** of 5 A correspond to prove ilkals #4 A DVR IS a of And interriting SVIPA PID Quita migre $(C.j.\overline{Z}(p))$. (\tilde{T}) I ~ A < I (Mat it XEO is divisitely TI.TI? TI?...?) UFOR. =) X=0. af 0-40) V. K* R V(a) = intger st. a= UTT ... trueox $K = Fm(O) \qquad \sqrt{a/b} = \sqrt{a} - \sqrt{b}$

Localizations of Dedekind domains Prop 17 K 15 a Perekind dong, on SER-403 multiplicative robjet the STR is also perecent domain 14 - noether (ER noeterin) (ser - every nonzev, den (, 5 maximal (previa) prime siden (, 5 maximal (previa) side) - integrally (list of m field of fractory G; KR XEK schshal x + ?: x + ?: = 0 Sies Franch =) horses, -so, sx interlove = Kracs-IR R, have in R,

Dedekind domains and discrete valuation rings prop R = noether interal Aman. (e.s. The R is bedekind Aman. The R is bedekind Aman. For every prome stral for the field Rep is a MMR. Four on "I, f" direction. INRP, Identi we parter of pRy Dus O (1yungra ficher, antime Fidents in R)

Valuations on the rational integers

on the low de time <u>p-alicizion</u> up two cy processis (c.g. by astrono for Rep)

luations on a Dedekind domain For R a Deckind domain Altre ~ F-adic valuation Vf: R-LU) -> Z (Fac R)* Ve(L):export of fir tuchenzation of (L)