

2019 $\frac{1}{2}$ 2020

$$10 \qquad F \qquad \left\{ \begin{pmatrix} a & 2b \\ b & a \end{pmatrix} \middle| a \in F, b \in F \right\}$$

$$10 \qquad \mathbb{Z}_8$$

$$10 \qquad \mathbb{Z}_5[x] \qquad f(x)=x^3+2x+3, \, g(x)=x^3+x \qquad f(x),g(x)$$

$$10 \qquad \mathbb{Z}[x]/<x^2+1>\cong \mathbb{Z}[\sqrt{-1}]$$

$$20 \qquad R=\left\{\frac{a}{b} \middle| a,b\in \mathbb{Z}, b \text{ 为奇数} \right\} \quad I=\left\{\frac{a}{b} \middle| a,b\in \mathbb{Z}, b \text{ 为奇数}, a \text{ 为偶数} \right\}$$

$$1 \quad I \quad R$$

$$2 \quad I \quad R$$

$$20 \qquad \mathbb{Z}[\sqrt{-3}]=\left\{a+b\sqrt{-3} \middle| a,b\in \mathbb{Z} \right\}$$

$$1 \qquad \mathbb{Z}[\sqrt{-3}]$$

$$2 \qquad 14$$

$$3 \quad \mathbb{Z}[\sqrt{-3}]$$

$$10 \qquad \alpha \quad x^3-6x^2+9x+3 \qquad [\mathbb{Q}(\alpha):\mathbb{Q}]=3 \qquad (1+\alpha)^{-1}$$

$$1,\alpha,\alpha^2$$

$$10 \qquad E \quad F \qquad 1 \quad F \qquad d$$

$$E=\mathbb{Q}[\sqrt{d}] \qquad p \qquad p^2 \middle| d \quad 2 \quad F \qquad 2$$

$$d \in F \qquad E = F[\sqrt{d}] \quad F$$

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