21-128 Lecture

Chapter 0
Sets, propositions
Base b

$$\mathbb{N}$$
$$\mathbb{Z}$$
$$\mathbb{Q}$$
$$\mathbb{R}$$
$$\mathbb{C}$$

there exists

unique / only 1

for every

$$\forall \ a, b \in \mathbb{Z}, \ b \neq 0 \implies \exists ! \ q, R \in \mathbb{Z} \ \text{S.T.} \ a = bq + R$$
$$\wedge \ 0 \leq R \leq |b|$$

$$\forall \ a, b \in \mathbb{Z} \ \text{we say} \ a | b \iff \text{there is} \ C \in \mathbb{Z} \ \text{S.T.} \ b = a \cdot c$$

divides

Assume $x \in \mathbb{R}$ and $\sqrt{x-3} = x - 5$

$$\sqrt{x-3} = x - 5$$
$$\implies x - 3 = (x-5)^2$$
$$\implies x - 3 = x^2 - 10x + 25$$
$$\implies 0 = x^2 - 11x + 28$$
$$\implies 0 = (x-7)(x-4)$$
$$\cancel{x = 4} \quad \boxed{x = 7}$$