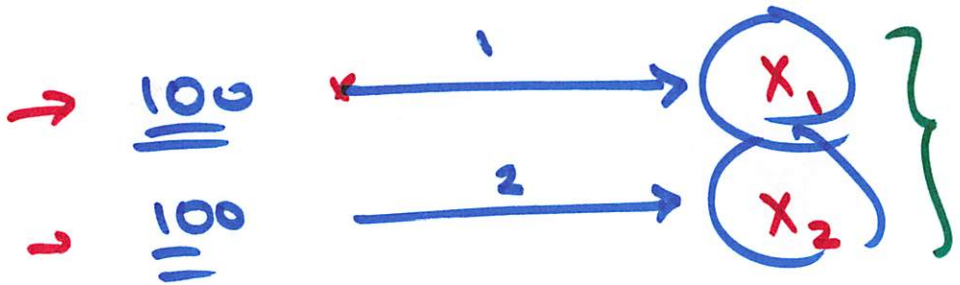
Decisions Under Uncertainty

→ Random



if $X_1 > X_2$ ⇒ pick 1, if not pick 2

Deterministic Var

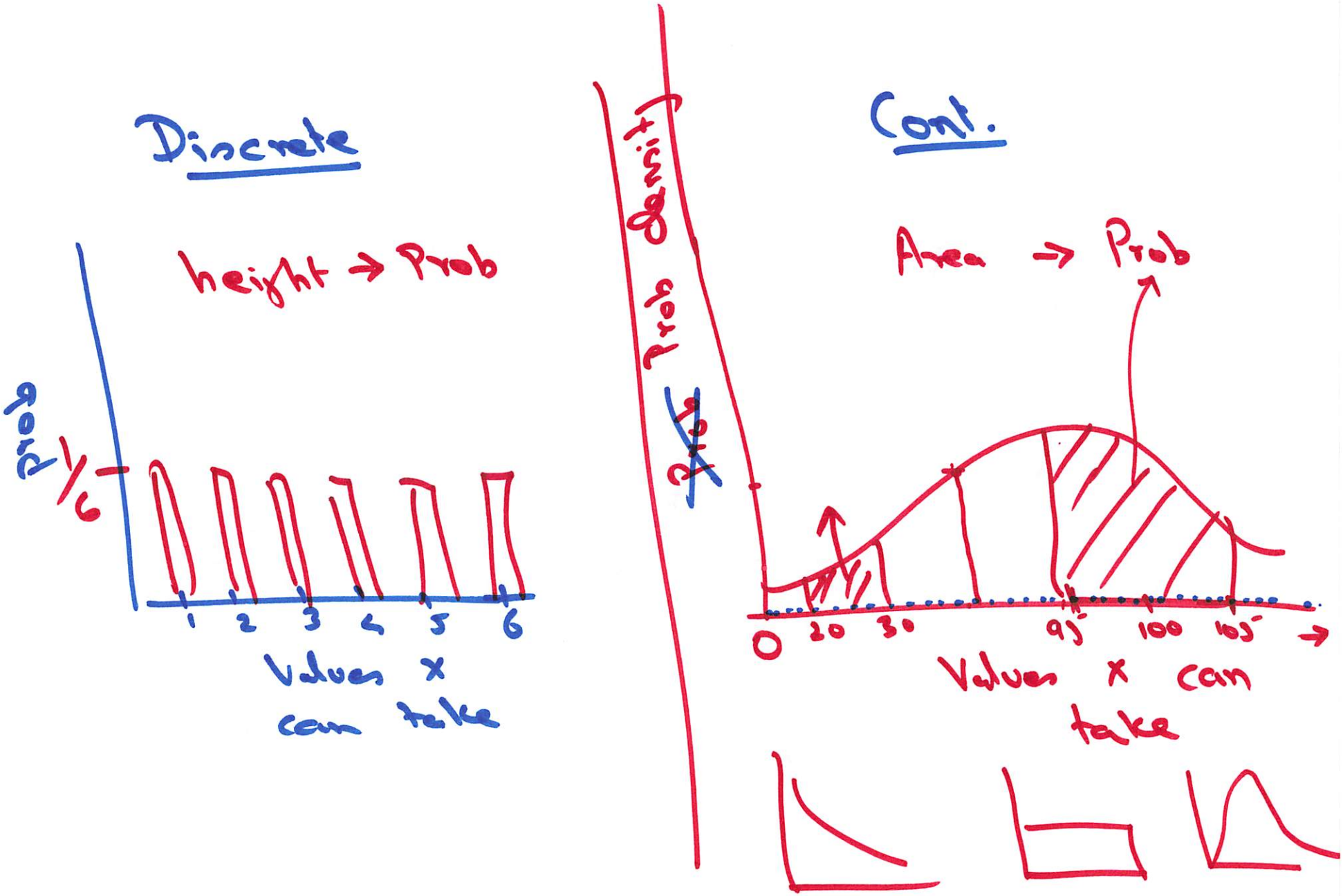
$Z = 20$

Random Var

$X =$

- value x can take
- correspondig % chances of each value

Distribution



X → $E(X_1)$ → 100
X → $E(X_2)$ → 110

} ~~Reward~~

0

100000

H → ~~200000~~ 200001

T → 0

$E(X_1) = 100000$

$E(X_2) = 100000.5$

Reward Vs Risk

$x_1 \quad x_2 \quad x_3 \quad \ldots\ldots\ldots \quad x_{100}$

Reward → Measure of Center: Mean: Avg $= \sum x_i / 100 = \bar{x}$

median, mode

Risk → Measure of Spread: ① Range x

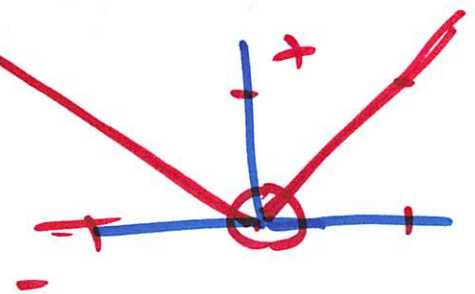
↳ $\max(x_i) - \min(x_i)$

② Avg dist from center

intuitive & Simple ⇒

$$\frac{\sum |(\bar{x} - x_i)|}{100}$$

Not math. convenient



Std dev = $\sqrt{\left(\frac{\sum(\bar{x} - x_i)^2}{100}\right)}$ ⇐ Presentation of Risk

Var $V = \frac{\sum(\bar{x} - x_i)^2}{100}$ ⇐ Measure Risk