

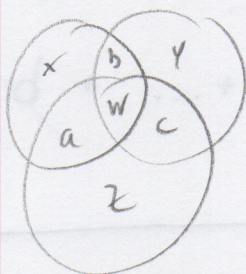
7.1 UNIONS $A \cup B$

INTERSECTIONS $A \cap B$

UNIVERSAL SET U "REMOVE"

↓
COMPLEMENT $A' = U \setminus A$

7.2 VENN DIAGRAMS



7.3 SAMPLE SPACE $S = \left\{ \begin{array}{l} \text{all poss} \\ \text{outcomes} \end{array} \right\}$

SIMPLE EVENTS

$$P(S) = 1$$

$$P(A \cup B) = P(A) + P(B)$$

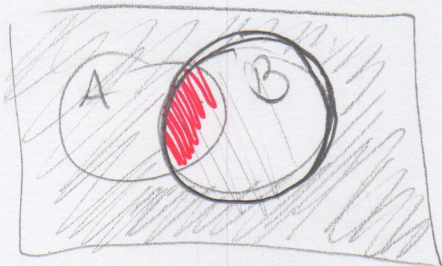
$$0 \leq P(A) \leq 1$$

$$- P(A \cap B)$$

$$P(A') = 1 - P(A)$$

7.5

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$



$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A \cap B) = P(A|B)P(B)$$

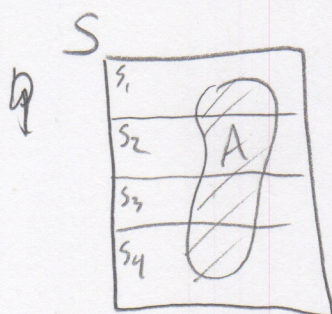
INDEP. EVENTS: A, B

$$1) P(A) = P(A|B)$$

$$2) P(A \cap B) = P(A)P(B)$$

...

7.6 LAW OF TOT. PROB



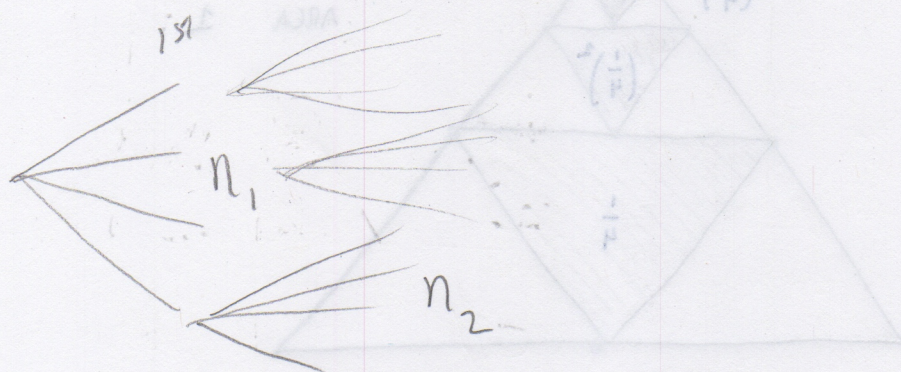
$$P(A) = P(A \cap S_1) + \dots + P(A \cap S_4)$$

$$P(A) = P(S_1)P(A|S_1) + \dots + P(S_4)P(A|S_4)$$

BAYES' RULE

$$P(S_i|A) = \frac{P(S_i)P(A|S_i)}{P(A)}$$

8.1-8.3 COUNTING



$$N = n_1 \cdot n_2 \cdot \dots \cdot n_m$$

3 APP 2 ENTRIES 4 DESKETS

$$3 \cdot 2 \cdot 4 = 24 \text{ MEANS}$$

COMBINATIONS

$$C(n, r) = \frac{n!}{r! \cdot (n-r)!}$$

PERMUTATIONS

$$P(n, r) = \frac{n!}{(n-r)!}$$

ex. 8 GOATS 5 SHEEP 7 LLAMAS

PICK 6 ANIMALS AT RANDOM

FIND PROB PICK 2 OF EACH

$$\frac{C(8, 2) C(5, 2) C(7, 2)}{C(20, 6)}$$

8.4

BINOMIAL EXP.

n TRIALS

p SUCCESS

$q = 1 - p$ FAILURE

$X = \#$ SUCCESSSES IN
 n TRIALS

$$P(X=k) = C(n,k) p^k q^{n-k}$$

H T T H H H T A T H

↓

$X = 6$ R.V.

$$\mu = np \quad \sigma = \sqrt{npq}$$

8.5

R.V. DISTN.

x	-1	50-1	10000000-1
$p(x)$	.99	.009	.001

$$E(x) = \mu = \sum x p(x)$$

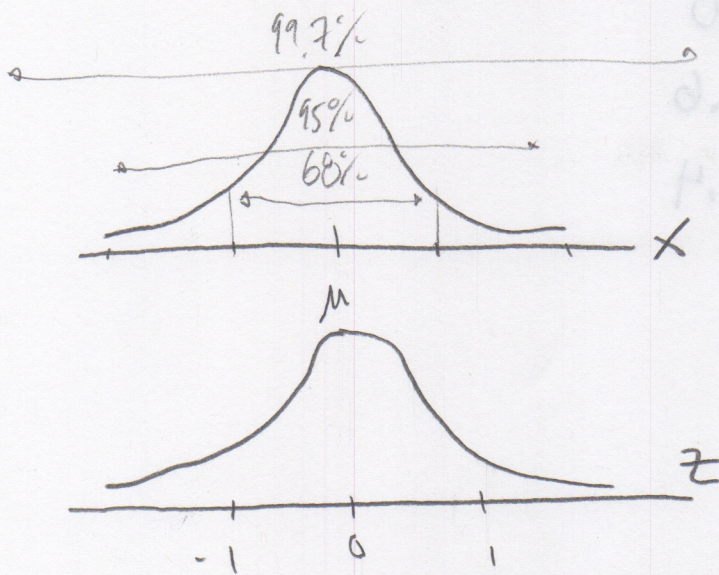
$$\sigma = \sqrt{\sum (x - \mu)^2 p(x)}$$

CH. 9 Normal Distn.

MEAN, MEDIAN, MODE

STANDARD DEVIATION).

MEASURE OF VARIATION



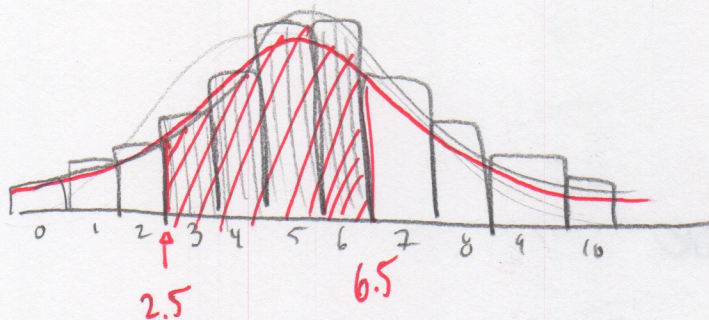
$$z = \frac{x - \mu}{\sigma}$$

$$P(x \leq x_0) = P(z \leq \frac{x_0 - \mu}{\sigma})$$

TABLE

$$P(z \leq z_0) = .8$$

9.4



$$P(3 \leq x \leq 6) \quad X \text{ BINOMIAL}$$

$X \approx \text{normal}$

$$\mu = np$$

$$\sigma = \sqrt{npq}$$

$$\begin{cases} n=10 \\ p=.6 \\ q=.4 \end{cases}$$

$$P(2.5 \leq X_{\text{normal}} \leq 6.5)$$

$$P\left(z \leq \frac{6.5 - \mu}{\sigma}\right) - P\left(z \leq \frac{2.5 - \mu}{\sigma}\right)$$

$$P(X \geq x_0) = 1 - P(X \leq x_0)$$

$$? = \left(\frac{1}{b} \times \frac{a}{1}\right) \times \frac{a}{1}$$

use property 6 to compute