

6.3 General Probability Rules

$P(\text{club or diamond or King of hearts})$

$P(\text{King or heart})$

ActivStats III 14-1 Birthweights and Smoking
ActivStats III 14-1 Conditional Probability
ActivStats III 14-1 Probabilities and Tables

Definition of Conditional Probability

book

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

formula sheet

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

For 1 card drawn,
P(king | red card)=

$$P(Q\&Q)=$$

$$P(Q\&Q\&Q)=$$

Tree diagrams revisited

<http://www-stat.stanford.edu/~susan/surprise/ProbabilityTree.html>



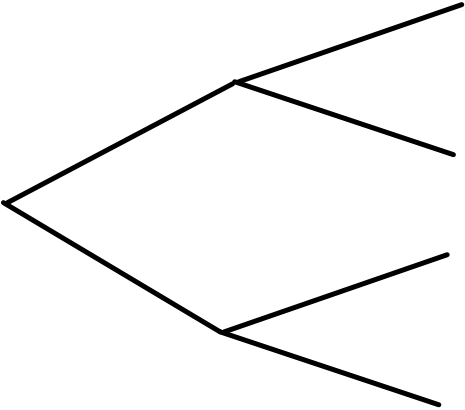
<http://www.gametheory.net/Mike/applets/Bayes/Bayes.html>



<http://www.gametheory.net/Mike/applets/Bayes/WhoReward.html>



Suppose a test for a genetic disorder is 95% accurate and that 10% of the population has the disorder. What is $P(\text{infected}|\text{positive})$?



A definition (test) for independence

Two events are independent iff $P(B|A)=P(B)$

For independent events:

$$P(A \text{ and } B) = P(A)P(B)$$

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

For ANY events:

$$P(A \text{ and } B) = P(A)*P(B|A)$$

A definition (test) for independence

Two events are independent iff $P(B|A)=P(B)$

Suppose I select 1 card. Are these events independent?

king
heart

club
heart

king
face card