Conditional Probability Formula:

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

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

| | Chevy | Ford | Cadillac | Mercedes | Total |
|---|---|---|---|---|---|
| Under 30 | 32 | 37 | 10 | 15 | 94 |
| ≥ 30 | 15 | 18 | 38 | 29 | 100 |
| Total | 47 | 55 | 48 | 44 | 194 |

c) $P(\text{Ford} \mid \text{Under 30}) = \frac{37}{94}$

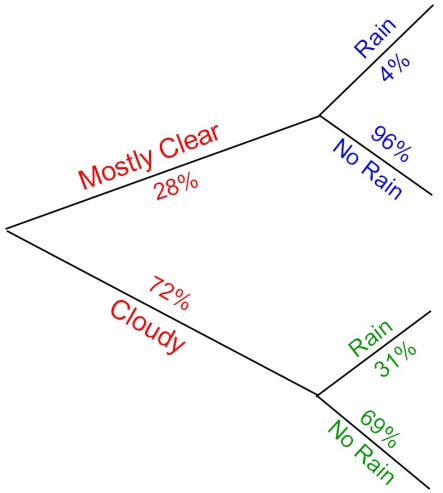
c) $P(\underset{B}{\text{Ford}} \mid \underset{A}{\text{Under 30}}) = \frac{P(\text{Under 30 and Ford})}{P(\text{Under 30})} = \frac{\frac{37}{194}}{\frac{94}{194}} = \frac{37}{94}$

Using a Tree Diagram

- On 28% of the days the sky is mostly clear
- On 72% of the days the sky is cloudy

- During the mostly clear days, it rains 4% of the time

- During cloudy days, it rains 31% of the time

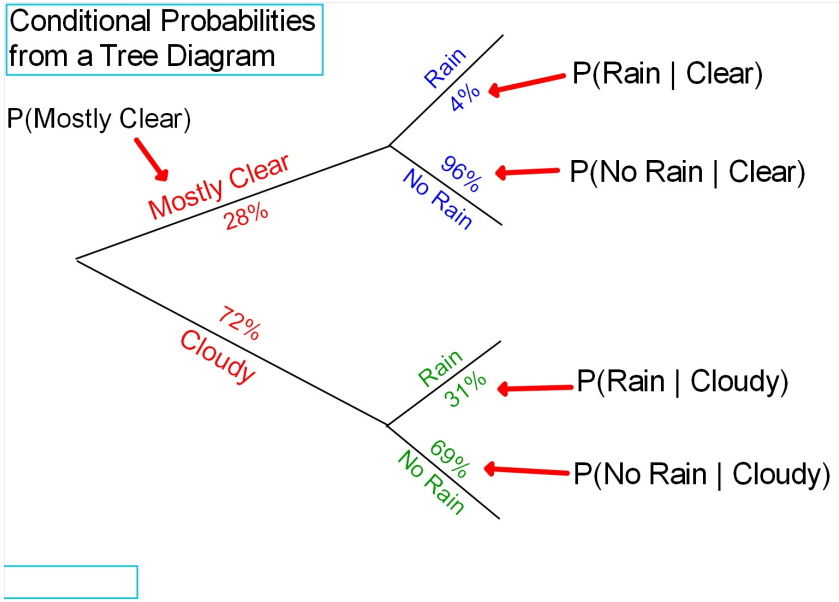


Use the Tree Diagram to find each probability as a percent to the nearest tenth.

a) P(Rain | Cloudy) = 31%

b) P(No Rain | Clear) = 96%

Conditional Probabilities from a Tree Diagram




Given the definition of conditional probability $P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)}$ $\cdot P(A)$

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

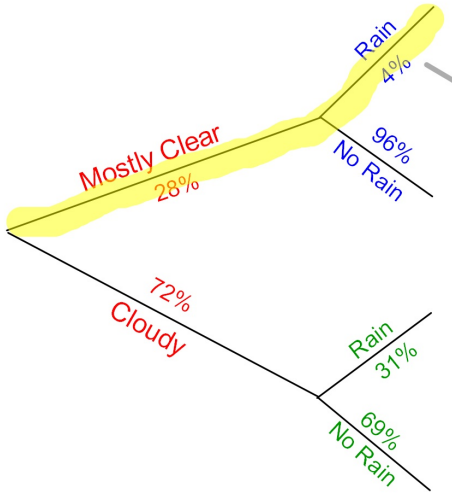
Use the tree diagram to find the following probability

P ( Clear and Rain) =

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

P ( Clear and Rain) = P(Clear)• P(Rain|Clear)

P(A and B) = P(A) • P(B | A)

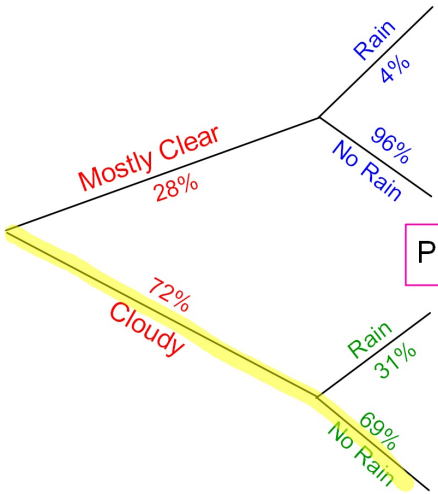



P ( Clear and Rain)
= P(Clear)• P(Rain|Clear)

(28%)(4%)

= 1.12 %

P(A and B) = P(A) • P(B | A)




P ( Cloudy and No Rain) =

p(cloudy) P(No Rain | cloudy)

72% • 69%

49.68%

Section 12-3: Analyzing Data → Statistics

Measures of Central Tendancy: The 3 M's

- Mean — Sum of data values / Number of data values → symbol $\bar{x}$
- Median — The middle value when data is put in order
- Mode — The value(s) that occur the MOST often

Find the mean, median, and mode for each data set.

Set 1: 16, 23, 30, 18, 19, 95, 23, 17, 9, 14

$\bar{x} = 26.4$

med = 18.5

mode = 23

Set 2: 103, 111, 109, 99, 123, 114, 103, 107, 99

$\bar{x} = 107.56$

med = 107

mode = 99, 103

Using the graphing calculator:

58, 99, 53, 60, 49, 55, 45, 61, 58, 59, 55, 52

$\bar{x} =$ 58.67

med = 56.5

mode: 55, 58

Set 1: 16, 23, 30, 18, 19, 95, 23, 17, 9, 14

**Outlier** An item with a value that is substantially different from the other items in the set.

What statistic is usually most affected by an outlier?

Usually the mean

$\bar{x}$ w/ outlier 95 = 26.4

w/o outlier = 18.8

If there is an outlier what could this indicate?

possibly an error when collecting data, or that somebody "cheated", or a machine needs to be repaired.....

What is the mode of this set of data?

41, 47, 46, 47, 39, 41, 39, 46

NO MODE They all appear the same number of times.