Section 12.2 - Conditional Probability

Obj: -To find conditional probabilities
-To use formulas and tree diagrams

Conditional Probability:

$$p(A \cap B) = p(A) \cdot p(B \mid A)$$

and prob of B given A (after A has happened)

1. **Education and Salary of Employees**

	Under $20,000	$20,000-$30,000	Over $30,000
Less than high school	69	36	2
High school	112	98	14
Some college	102	193	143
College degree	13	178	245

The table contains information about the 1205 employees at one business. Find each probability. Round to the nearest tenth of a percent.

a. *P*(employee has less than a high school education)

b. *P*(employee earns under $20,000)

c. *P*(employee earns over $30,000 and has less than a high school education)

d. *P*(employee earns under $20,000 and has a college degree)

e. given that the employee has only a high school education, the probability that the employee earns over $30,000.

f. given that the employee earns over $30,000, the probability that the employee has only a high school education or less.

2. High school students in one school chose their favorite leisure activity. Find each probability. Round to the nearest tenth of a percent.

Favorite Leisure Activities

	Sports	**Hiking**	**Reading**	**Phoning**	**Shopping**	**Other**
Female	39	48	85	62	71	29
Male	67	58	76	54	68	39

a. P(sports | female)

b. P(female | sports)

c. P(reading | male)

d. P(male | reading)

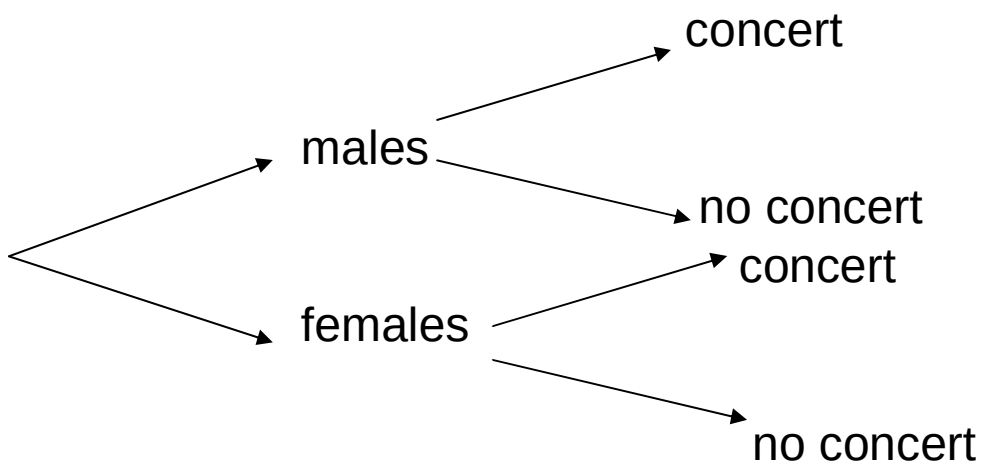
e. P(hiking | female)

f. P(hiking | male)

g. P(male | shopping)

h. P(female | shopping)

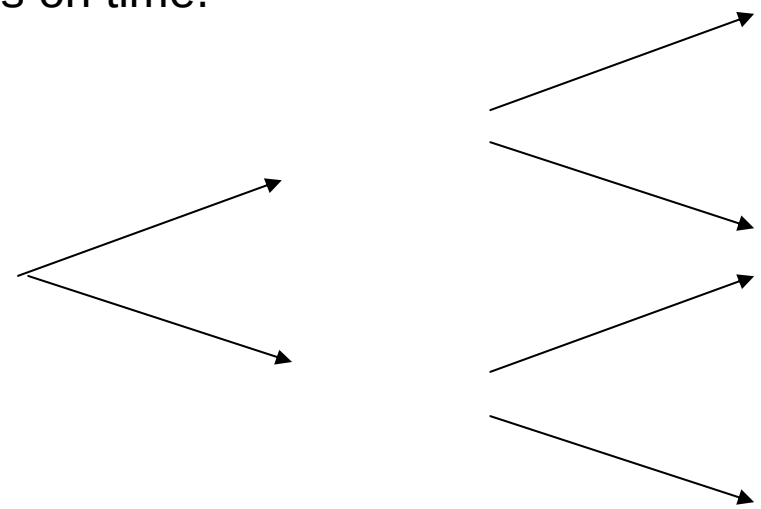
3. The students of a high school are 51% males; 45% of the males and 49% of the females attend concerts. Draw a tree diagram.



a. Find the probability that a student attends concerts

b. Find the probability that a student is a female and does not attend concerts

4. Eighty percent of an airline's flights depart on schedule. Seventy two percent of its flights depart and arrive on schedule. Given that a flight departs on time, find the probability that it also arrives on time.



$$p(A \cap B) = p(A) \cdot p(B \mid \mathrm{A})$$

Let A be departs on time. Let B be arrives on time.