

$$P(\text{Absent}|\text{Friday}) = \frac{P(\text{Friday and Absent})}{P(\text{Friday})} = \frac{0.03}{0.2} = 0.15 = 15\%$$

Example 3: At Kennedy Middle School, the probability that a student takes Technology and Spanish is 0.087. The probability that a student takes Technology is 0.68. What is the probability that a student takes Spanish given that the student is taking Technology?

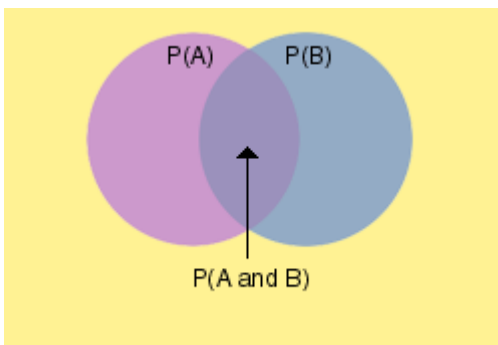
Solution:

$$P(\text{Spanish}|\text{Technology}) = \frac{P(\text{Technology and Spanish})}{P(\text{Technology})} = \frac{0.087}{0.68} = 0.13 = 13\%$$

Summary: The conditional probability of an event B in relationship to an event A is the probability that event B occurs given that event A has already occurred. The notation for conditional probability is  $P(B|A)$ , read as *the probability of B given A*. The formula for conditional probability is:

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

The Venn Diagram below illustrates  $P(A)$ ,  $P(B)$ , and  $P(A \text{ and } B)$ . What two sections would have to be divided to find  $P(B|A)$ ? [Answer](#)



## Exercises

Directions: Read each question below. Select your answer by clicking on its button. Feedback to your answer is provided in the RESULTS BOX. If you make a mistake, choose a different button. **Answer choices have been rounded to the nearest percent.**

1. In New York State, 48% of all teenagers own a skateboard and 39% of all teenagers own a skateboard and roller blades. What is the probability that a teenager owns roller blades given that the teenager owns a skateboard?

- ☐ 87%
- ☒ 81%
- ☐ 123%
- ☐ None of the above.

RESULTS BOX:

Correct!

2. At a middle school, 18% of all students play football and basketball and 32% of all students play football. What is the probability that a student plays basketball given that the student plays football?

- ☒ 56%
- ☐ 178%
- ☐ 50%
- ☐ None of the above.

RESULTS BOX:

Correct!

3. In the United States, 56% of all children get an allowance and 41% of all children get an allowance and do household chores. What is the probability that a child does household chores given that the child gets an allowance?

- ☐ 137%
- ☐ 97%
- ☒ 73%
- ☐ None of the above.

RESULTS BOX:

Correct!

4. In Europe, 88% of all households have a television. 51% of all households have a television and a VCR. What is the probability that a household has a VCR given that it has a television?

- ☐ 173%
- ☒ 58%
- ☐ 42%
- ☐ None of the above.

RESULTS BOX:

Correct!

5. In New England, 84% of the houses have a garage and 65% of the houses have a garage and a back yard. What is the probability that a house has a backyard given that it has a garage?

- ☒ 77%
- ☐ 109%
- ☐ 19%
- ☐ None of the above.

RESULTS BOX:

Correct!