Name _____ Class _____ Date _____

Reteaching: Section 14-6

Conditional Probability Formulas

Using Conditional Probabilities

Suppose there is a course on compass navigation available at your school. What is the probability you take the course and don't get lost on your next hike?

Suppose 60% of the freshman at your school take the compass navigation course. The probability of a student taking the course and not getting lost on their next hike is 50%.

What is the probability that someone who took the course did *not* get lost on his next hike?

$$P(\text{did not get lost} \mid \text{took course}) = \frac{P(\text{took the course and did not get lost})}{P(\text{took the course})} = \frac{0.5}{0.6} \approx 0.83$$

What is the probability that someone who took the course got lost on his next hike?

$$P(\text{got lost} \mid \text{took course}) = \frac{P(\text{took the course and did not get lost})}{P(\text{took the course})} = \frac{0.1}{0.6} \approx 0.167$$

Exercises

In a survey, half of the students walk to school and the other half take the bus. Out of all the students who were surveyed, 35% took the bus to school and played sports and 20% walked to school and did not play sports.

Use the information given above to find each conditional probability.

1. $P(\text{plays sports} \mid \text{takes bus})$

2. $P(\text{plays sports} \mid \text{walks})$

3. What is the probability that someone who walks to school does *not* play sports?

Name _____ Class _____ Date _____

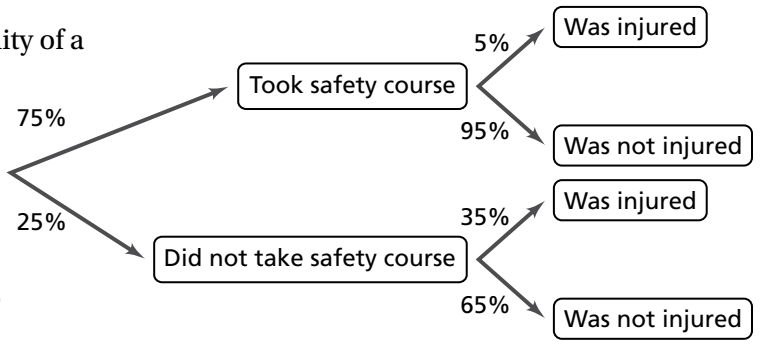
Reteaching (continued)

Conditional Probability Formulas

Combining Conditional Probabilities

There is an optional woodworking safety course available after school. Do you think that taking the course decreases your chances of getting injured while in woodworking class?

The tree diagram below shows the percentages of students who took the course and who were injured in woodworking class within the following year.



You can determine the probability of a randomly chosen student taking the course and getting injured within the next year by multiplying the probabilities of that branch:

$0.75 \cdot 0.05 = 0.0375$ or 3.75%

What about the overall probability of getting injured? You've already determined the probability of taking the course and getting injured. Now you can determine the probability of *not* taking the course and getting injured:

$0.25 \cdot 0.35 = .0875$ or 8.75%

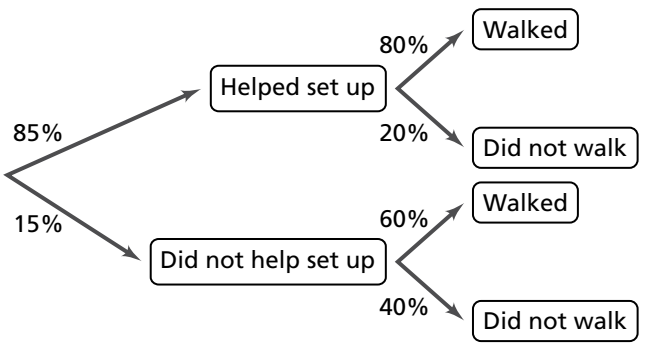
Now, add the probabilities together: $0.0375 + 0.0875 = 0.125$.

So, the combined probability of getting injured is 12.5%.

Exercises

The tree diagram below shows the percentages of students who helped set up a charity walk and the percentages of those who walked in the event.

Use the tree diagram to determine the probabilities.



4. What is the probability that a student who helped set up walked in the event?
5. What is the probability that a student who did not help set up walked in the event?
6. What is the combined probability of students who walked in the event?