Probability Topics: Practice II*

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Abstract

This module allows students to practice using what they've learned about Probability. Students will apply their understanding of basic probability terms, calculate probabilities based on the data provided, and determine whether events are independent or mutually exclusive.

1 Student Learning Objectives

- Students will define basic probability terms.
- Students will practice calculating probabilities.
- Students will determine whether two events are mutually exclusive or whether two events are independent.

NOTE: Use probability rules to solve the problems below. Show your work.

2 Given

68% of Californians support the death penalty. A majority of all racial groups in California support the death penalty, except for black Californians, of whom 45% support the death penalty (*Source: San Jose Mercury News, 12/2005*). 6% of all Californians are black (*Source: U.S. Census Bureau*).

In this problem, let:

- C = Californians supporting the death penalty
- B = Black Californians

Suppose that one Californian is randomly selected.

3 Analyze the Data

Exercise 1 *(Solution on p. 3.)*

$P(C) =$

Exercise 2 *(Solution on p. 3.)*

$P(B) =$

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Exercise 3 *(Solution on p. 3.)*
$P(C|B) =$

Exercise 4
In words, what is " $C \mid B$"?

Exercise 5 *(Solution on p. 3.)*
$P(B \text{ AND } C) =$

Exercise 6
In words, what is "B and C"?

Exercise 7 *(Solution on p. 3.)*
Are B and C independent events? Show why or why not.

Exercise 8 *(Solution on p. 3.)*
$P(B \text{ OR } C) =$

Exercise 9
In words, what is "B or C"?

Exercise 10 *(Solution on p. 3.)*
Are B and C mutually exclusive events? Show why or why not.

Solutions to Exercises in this Module

Solution to Exercise 1 (p. 1)
0.68
Solution to Exercise 2 (p. 1)
0.06
Solution to Exercise 3 (p. 2)
0.45
Solution to Exercise 5 (p. 2)
0.027
Solution to Exercise 7 (p. 2)
No
Solution to Exercise 8 (p. 2)
0.713
Solution to Exercise 10 (p. 2)
No