

3.13: Bringing It Together- Practice

Use the following information to answer the next seven exercises. An article in the *New England Journal of Medicine*, reported about a study of smokers in California and Hawaii. In one part of the report, the self-reported ethnicity and smoking levels per day were given. Of the people smoking at most ten cigarettes per day, there were 9,886 African Americans, 2,745 Native Hawaiians, 12,831 Latinos, 8,378 Japanese Americans, and 7,650 Whites. Of the people smoking 11 to 20 cigarettes per day, there were 6,514 African Americans, 3,062 Native Hawaiians, 4,932 Latinos, 10,680 Japanese Americans, and 9,877 Whites. Of the people smoking 21 to 30 cigarettes per day, there were 1,671 African Americans, 1,419 Native Hawaiians, 1,406 Latinos, 4,715 Japanese Americans, and 6,062 Whites. Of the people smoking at least 31 cigarettes per day, there were 759 African Americans, 788 Native Hawaiians, 800 Latinos, 2,305 Japanese Americans, and 3,970 Whites.

59. Complete the table using the data provided. Suppose that one person from the study is randomly selected. Find the probability that person smoked 11 to 20 cigarettes per day.

Table 3.13.13 Smoking Levels by Ethnicity

Smoking level	African American	Native Hawaiian	Latino	Japanese Americans	White	TOTALS
1–10						
11–20						
21–30						
31+						
TOTALS						

60. Suppose that one person from the study is randomly selected. Find the probability that person smoked 11 to 20 cigarettes per day.

61. Find the probability that the person was Latino.

62. In words, explain what it means to pick one person from the study who is “Japanese American **AND** smokes 21 to 30 cigarettes per day.” Also, find the probability.

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64. In words, explain what it means to pick one person from the study who is “Japanese American | that person smokes 21 to 30 cigarettes per day.” Also, find the probability.

65. Prove that smoking level/day and ethnicity are dependent events.

Use the following information to answer the next two exercises. Suppose that you have eight cards. Five are green and three are yellow. The cards are well shuffled.

66. Suppose that you randomly draw two cards, one at a time, **with replacement**.

Let G_1 = first card is green

Let G_2 = second card is green

Use the following information to answer the next two exercises. The percent of licensed U.S. drivers (from a recent year) that are female is 48.60. Of the females, 5.03% are age 19 and under; 81.36% are age 20–64; 13.61% are age 65 or over. Of the licensed U.S. male drivers, 5.04% are age 19 and under; 81.43% are age 20–64; 13.53% are age 65 or over. **68.**

Complete the following.

69. Suppose that 10,000 U.S. licensed drivers are randomly selected.

70. Approximately 86.5% of Americans commute to work by car, truck, or van. Out of that group, 84.6% drive alone and 15.4% drive in a carpool. Approximately 3.9% walk to work and approximately 5.3% take public transportation.

71. When the Euro coin was introduced in 2002, two math professors had their statistics students test whether the Belgian one Euro coin was a fair coin. They spun the coin rather than tossing it and found that out of 250 spins, 140 showed a head (event H) while 110 showed a tail (event T). On that basis, they claimed that it is not a fair coin.

- a. Construct a table or a tree diagram of the situation.
- b. Find $P(\text{driver is female})$.
- c. Find $P(\text{driver is age 65 or over} \mid \text{driver is female})$.
- d. Find $P(\text{driver is age 65 or over} \cap \text{female})$.
- e. In words, explain the difference between the probabilities in part c and part d.
- f. Find $P(\text{driver is age 65 or over})$.
- g. Are being age 65 or over and being female mutually exclusive events? How do you know?
- h. How many would you expect to be male?
- i. Using the table or tree diagram, construct a contingency table of gender versus age group.
- j. Using the contingency table, find the probability that out of the age 20–64 group, a randomly selected driver is female.
- k. Construct a table or a tree diagram of the situation. Include a branch for all other modes of transportation to work.
- l. Assuming that the walkers walk alone, what percent of all commuters travel alone to work?
- m. Suppose that 1,000 workers are randomly selected. How many would you expect to travel alone to work?
- n. Suppose that 1,000 workers are randomly selected. How many would you expect to drive in a carpool?
- o. Based on the given data, find $P(H)$ and $P(T)$.
- p. Use a tree to find the probabilities of each possible outcome for the experiment of tossing the coin twice.
- q. Use the tree to find the probability of obtaining exactly one head in two tosses of the coin.
- r. Use the tree to find the probability of obtaining at least one head.

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