Lesson 11 Practice Problems

1. The two-way table shows the number of eggs laid by 10 Rhode Island red chickens and 10 leghorn chickens in July and August.

	eggs laid in July	eggs laid in August
Rhode Island red chicken	247	252
leghorn chicken	239	241

A chicken is selected at random. For each question, Event A is "egg laid by a Rhode Island red chicken" and Event B is "egg laid in July." Use the data to estimate the probabilities.

a. $P(\text{A})$

b. $P(\text{B})$

c. $P(\text{A and B})$

d. $P(\text{A} \mid \text{B})$

e. Use $P(\text{A} \mid \text{B}) = P(\text{A})$ and $P(\text{A and B}) = P(\text{A}) \cdot P(\text{B})$ to determine if the two events are dependent or independent. Show or explain your reasoning.

(From Unit 8, Lesson 10.)

2. Clare finds an article in the online student newspaper that says, "There are more students in the 9th grade this year than last year and there are more students in the 12th grade who are graduating this year than last year." Are the events "the number of students in the 9th grade" and "the number of 12th graders who are graduating" dependent or independent events? Explain your reasoning.

(From Unit 8, Lesson 10.)

3. The two-way table summarizes whether or not a softball team had practice when it was raining and when it was not raining at the start of the day.

	softball practice	no softball practice
raining	4	1
not raining	12	3

a. When it was raining at the start of the day, what is the probability that softball practice was held?

b. When it was not raining at the start of the day, what is the probability that softball practice was held?

c. Are the events of "holding softball practice" and "raining at the start of the day" dependent or independent events? Explain your reasoning.

(From Unit 8, Lesson 9.)

4. Mai rolls a standard number cube and then flips a fair coin. What is the probability that Mai flips heads under the condition that she rolls a 5?

A. $\frac{1}{2}$

B. $\frac{5}{6}$

C. $\frac{1}{12}$

D. $\frac{5}{12}$

(From Unit 8, Lesson 8.)

5. A total of 40 elementary, middle, and high school students participate in a fun run as a fundraiser. They are surveyed after the fun run to find out how many of them completed the fun run without walking. The results of the survey are shown in the table.

	elementary	middle	high
walked during the fun run	8	2	1
did not walk during the fun run	4	14	11

Mai, wants to know the probability that one of the participants in the fun run selected at random is an elementary school student or did not walk during the fun run. To figure this out, she adds the three values in the second row of the table (4, 14, and 11) to the two values listed under the heading "elementary school" (8 and 4). She then divides that answer by 40 and obtains a probability of $\frac{41}{40}$. Mai realizes that $\frac{41}{40}$ is greater than 1 and determines that she must have made a mistake.

 a. What is Mai's mistake? Explain your reasoning.

 b. How does the addition rule account for this kind of mistake?

(From Unit 8, Lesson 6.)

6. Two classes of middle school students who are going on a field trip were asked if they wanted to go to a science museum or an art museum. Each student selects one museum option. The table summarizes the museum preference of each student in the class.

	science museum	art museum
class A	14	12
class B	11	14

What is the probability that a student in class B selected at random prefers to go to the art museum?

(From Unit 8, Lesson 5.)

7. Elena decides which type of pizza to order. The choices for crust are thin crust, stuffed crust, or regular crust. The choices for one topping are pepperoni, mushrooms, olives, sausage, meatballs, pineapple, or green peppers. Elena has trouble deciding because there are so many possibilities. She selects the type of crust and one topping at random. How many outcomes are in the sample space?

    A. 3

    B. 7

    C. 10

    D. 21

(From Unit 8, Lesson 3.)