Skills Practice: Independent Events

1. Based on the definition of independence, determine if each set of events below are independent.

    a. $P(A) = 0.55, P(B) = .12, P(A \cap B) = 0.78$

    b. $P(A) = \frac{2}{3}, P(B) = \frac{4}{7}, P(A \cap B) = \frac{8}{21}$

2. The following events are **independent**. Find the missing values.

    a. $P(S) = 0.38, P(B) = .12, P(S \cap B) = $ _____

    b. $P(M) = 0.50, P(L) = $ _____ $, P(M \cap L) = 0.375$

3. What else might gender affect? Is your commute to work related to whether or not you are male or female? The data below allows you to investigate these questions by presenting gender data against the minutes needed to commute to work each day.

	Under 30 minutes	Between 30 minutes and an hour	Over an hour	
Male	65	24	15	
Female	64	22	7	

Are the events being female and commute under 30 minutes independent? Show all work.

4. An advertising agency in a large city is conducting a survey of adults to investigate whether there is an association between highest level of educational achievement and primary source for news. The company takes a random sample of 2,500 adults in the city. The results are shown in the table below.

| Primary Source for News | HIGHEST LEVEL OF EDUCATIONAL ACHIEVEMENT | | | Total |
	Not High School Graduate	High School Graduate But Not College Graduate	College Graduate	
Newspapers	49	205	188	442
Local television	90	170	75	335
Cable television	113	496	147	756
Internet	41	401	245	687
None	77	165	38	280
Total	370	1,437	693	2,500

a. What is the probability that the selected adult is a college graduate or obtains news primarily from the internet? Round all answers to the hundredths place.

b. Given that a college graduate is to be selected, what is the probability that the selected adult obtains news primarily from the internet? Round all answers to the hundredths place.

c. Are the events "is a college graduate" and "obtains news primarily from the internet" independent? Justify your answer.

7. Determine the following probabilities if each of the following are **independent**.

GIVEN: P(A) = 0.8   P(B) = 0.25   P(C) = 0.6

a. P(A and C) =   b. P(A and B and C)=

c. P(Rolling a 4 on a standard die and B) =

d. P(Rolling a 2 on a standard die and picking a card with a "7" on it from a standard deck of cards) =

e. If the Atlanta Hawks free throw percentage is 82%, what is the probability that a player for the Hawks will make 2 free shots in a row?

8. | GIVEN: | P(M) = 0.8 | P(N) = 0.25 | P(R) = 0.6 |

a. If the probability of **P(M and N) = 0.2,** are M and N independent?

b. If the probability of **P(N and R) = 0.3,** are N and R independent?

DEPENDENT PROBABILITIES

9. Consider that 3 consecutive cards are drawn **without replacement** from a shuffled deck of cards

a. What is the probability that the first two cards drawn are face cards?

b. What is the probability that the all three cards are hearts?

c. What is the probability that all three cards are a King?

10. A bag contains 4 blue marbles, 4 red marbles, and 4 green marbles. What is the probability of

drawing 2 green marbles **without replacement**?

11. James has 3 dimes, 4 pennies, and 2 quarters in his pocket. If each coin is equally likely to
be pulled out of his pocket in order **without replacement**, what is the probability that he
will pull out the 2 quarters in a row first?

12. In a cookie jar there are 10 chocolate chip cookies and 8 peanut butter cookies left. The
cookies are randomly mixed together in the jar. What is the probability of pulling two
chocolate chip cookies out of the cookie jar in a row **without replacement**?

13. In a classroom there are 7 male students and 11 female students that are taking a test. If each
student is equally likely to turn in their test at any given time at the end of class, what is the
probability that the first 3 students to turn in their test are female students?