Probability Review   NAME:_____

1. If you roll a pair of dice twice, what is the probability of getting doubles on the first roll and getting a sum of 7 on the second roll?

2. What is the probability that a sequence of five flips of a fair coin turns out to be exactly **HTHTT**?

3. A pair of dice are tossed. Find the probability that the sum on the two dice is 4, given that the sum is even.

4. A pair of dice are tossed. Find the probability that the sum on the two dice is 10, given that doubles are rolled.

5. A pair of dice are tossed. What is the probability that doubles are rolled, given that the sum on the two dice is less than 5?

6. A pair of dice are tossed. What is the probability that the sum on the two dice is 11, given that the sum is more than 6?

For problems 7-10 one card is drawn from a deck and then replaced, a second card is then drawn.

7. What is the probability that both cards pulled are face cards?

8. What is the probability that the first card drawn is a club and the second card is a red?

9.   What is the probability that the first card drawn is a 5 and the second card is not a 5?

10. Find the probability that the first card drawn is a face card and the second card is black.

For problems 11-14 a card is drawn from a deck and not replaced before the next card is drawn.
   11. What is the probability that both cards pulled are face cards?

12. What is the probability that the first card drawn is a club and the second card is a red?

13. What is the probability that the first card drawn is a face card and the second card is not a face card?

14. Find the probability that the first card drawn is a face card and the second card is an even number.

15. A random sample of the population was taken to create the table below. The table details occupations and food preferences. Use the table below to answer the following questions.

	Steak & 'Taters	Mexican	Chinese	Italian	Fast Food	**TOTAL**
Construction	65	22	18	43	55	203
Education	21	47	58	12	20	158
Entertainment	55	32	27	67	8	189
TOTAL	141	101	103	122	83	550

a. Which is more likely, a construction worker prefers Italian food or an educator prefers Chinese food?

b. Select a person at random.

Let event C be that the person chosen works in construction
Let event M be that the person chosen prefers Mexican food.

Determine the probability for all the items listed below, show your work.

i. P(C or M) =_____

ii. P(C and M)=_____

iii. $P(C|M)$ =_____

iv. $P(M|C)$ =_____

v. P(~M) =_____

c. Are events C and M independent? How did you determine this?

d. Are events C and M mutually exclusive? How did you determine this?

16. A survey of 468 sophomores asked if they regularly got the recommended 8 hours of sleep, and if they earned a 3.2 GPA or higher at their school. The results of the survey are in the table below.

	Gets Recommended sleep	Does not get recommended sleep	Total
On the honor roll 3.2 GPA or higher	60	72	132
Not on honor roll 3.2 below GPA	34	302	336
Total	94	374	468

A.   Suppose you pick a student at random.

Let P(A) be defined as P(student is on the honor roll)

Let P(b) be defined as P(gets recommended amount of sleep)

i)   Find P(A)

ii)   Find P(B)

iii)   Find P(A and B)

iv)   Find P(A or B)

v)   Find P(A │B)

vi)   Find P(B │A)

B. Are being on the honor roll and getting the recommended 8 hours of sleep independent events? Explain why or why not?

C. Are being on the honor roll and getting the recommended 8 hours of sleep mutually exclusive events? Why or why not?

17. Rebekka has 75 books in her library. She categorized them in the following way.

	Fiction	Non-Fiction	Total
Book for Teens	20	30	50
Book for Adults	10	15	25
Total	30	45	75

Suppose Rebekka picks a book at random. Find each probability.

    a. Find P(book for teens)

    b. Find P(fiction)

    c. Find P(book for teens│fiction)

    d. Find P(fiction│book for teens)

    e. Are book for teens and fiction independent events?

    f. Find P(book for teens or fiction)

18. Hannah is going to play one badminton match and one tennis match. The probability that she will win the badminton match is .9. The probability that she wins the tennis match is .4. What is the probability that she wins both matches? (Use a Tree Diagam)

NAME:_____

Name _____

1. While playing a board game, Jenny is sent to jail. To get out of jail, she needs to roll doubles. She wants to know the probability that she will fail to roll doubles in three tries.

a. Find the probability that Jenny fails to roll doubles in three tries.

b. Explain why you can use the Multiplication Rule for this situation.

2. A survey of 505 Teens by the American Academy of Dermatology included 254 boys and 251 girls. Thirty-three percent of the boys said they wear sunscreen, and 53% of the girls said they wear sunscreen.

a. Fill in the following table, showing the number of teenagers who fell into each category.

	Boy	Girl	Total
Wear Sunscreen			
Don't Wear Sunscreen			
Total			505

Source: www.aad.org/public/News/NewsReleases/Press+Release+
Archives/Skin+Cancer+and+Sun+Safety/Teen+Survey+Results.htm

b. Suppose you pick one student at random from these 505 teens. Find the probability of each of the following events.

i. P(*wears sunscreen*)

ii. P(*is a boy*)

iii. P(*wears sunscreen and is a boy*)

iv. P(*wears sunscreen or is a boy*)

v. P(*wears suncreen|is a boy*)

vi. P(*is a boy|wears sunscreen*)

    c.   Are being a boy and wearing sunscreen independent events? Explain your answer.

    d.   Are being a girl and not wearing sunscreen mutually exclusive? Explain why or why not.

3. Suppose you draw one card from a shuffled deck of cards.

    a.   Find the following probabilities.

- P(*card is an ace*)

- P(*card is a spade*)

- P(*card is an ace|card is a spade*)

- P(*card is a spade|card is an ace*)

- P(*card is an ace and card is a spade*)

- P(*card is an ace or card is a spade*)

    b.   Are the events *card is an ace* and *card is a spade* independent? Explain.

    c.   Are the events *card is an ace* and *card is a spade* mutually exclusive? Explain.