

**GRADE 12 APPLIED**  
**UNIT A PROBABILITY**  
**MUTUALLY EXCLUSIVE (ADDITION PROPERTY)**

Name: \_\_\_\_\_  
Date: \_\_\_\_\_

State all answers as a fraction and as a percentage rounded to at least the nearest tenth.

**SHOW YOUR WORK**

1. Are the following events mutually exclusive? If not, state a common outcome.

a. You want to find the probability of drawing a queen or a red card from a deck of cards.

b. You want to find the probability of rolling doubles or rolling a sum of 7 on a pair of dice.

c. You want to find the probability of drawing a prime number or a multiple of 3 from a hat that has numbers 1 to 50 on a piece of paper.

2. The numbers 1 to 30 are written on pieces of paper in a well shaken basket. Determine the probability of drawing:

- a. an odd number or a prime number? (a prime number is one that has no factors except itself and 1: (eg: 2, 3, 5, 7, 11, 13, 17,...))
- b. a number less than 12 or a double digit number?
- c. a perfect square or an even number?
- d. a multiple of 5 or a number between 16 and 19 [inclusive]?

3. A well shuffled deck of cards is used to deal out a single card. Calculate the probability of dealing:

- a. an ace or a club?
- b. an ace or a black card?
- c. an ace or a face card?

4. A pair of dice is placed in a container and well shaken. Determine the probability of rolling:

- a. 'doubles' or a sum of 9?
- b. at least one 4 or a sum of 8?
- c. a sum less than 6 or doubles?

5. Seven blue marbles and five yellow marbles are placed in a bag. A marble is drawn, **placed back** in the bag and a second marble is chosen. What is the probability of drawing two blue marbles or two yellow marbles? [ie: Prob ( $B_1B_2$  or  $Y_1Y_2$ )

6. A well shuffled deck of cards is used to deal out a single card. Once it is viewed, it is put back in the deck and a second card is dealt out.

Determine the probability of drawing:

- a. two non-face cards or two red cards?
- b. two queens or two diamonds?

7. What is the probability that a coin will turn up heads at least once in six tosses of a coin? (hint: at least once means not never!)

8. *Challenge.* In a plane crash it was reported that three persons out of the total of twenty passengers were injured. Three newspapermen were in this plane. What is the probability that the three reported injured were the newspapermen?

9. Calculate the probability of getting at least one sum of 11 in three throws of a pair of dice?

**Ans:**

- 1a.                    1b.                    1c.  
 2a. 53.3%    2b. 100%            2c. 60%  
 2d. 26.7% if 16-19 inclusive ; 33.3% if not inclusive, ie: just 17 & 18  
 3a. 30.8%    3b. 53.8%    3c. 30.8%  
 4a. 27.8%    4b. 41.7%  
 4c. 38.9% if less than 6 (ie: not including 6); 50% if did 6 or less,  
 5. 51.4%  
 6a. 69.4%    6b. 6.8%  
 7. 63/64  
 8. 1/1140  
 9. 919/5832