

## Mutually Exclusive/ Non-Mutually Exclusive Worksheet

Determine if the events are *mutually exclusive* or *non-mutually exclusive*. Then determine the probability of each.

1. Find the probability of choosing a penny or a dime from 4 pennies, 3 nickels and 6 dimes.
2. Find the probability of selecting a boy or a blond-haired person from 12 girls, 5 of whom have blond hair, and 15 boys, 6 of whom have blond hair.
3. Find the probability of drawing a king or queen from a standard deck of cards.
4. The probability for a driver's license applicant to pass the road test the first time is  $\frac{5}{6}$ . The probability of passing the written test on the first attempt is  $\frac{9}{10}$ . The probability of passing both test the first time is  $\frac{4}{5}$ . Are the events mutually exclusive? What is the probability of passing either test on the first attempt?
5. Find the probability of tossing two dice and either one showing a 4.
6. Find the probability of selecting an ace or a red card from a deck of cards.
7. Determine the probability that a card drawn from a deck is red or a face card.
8. Find the probability of two dice being tossed and showing a sum of 6 or a sum of 9.
9. A weather forecaster states that the probability of rain is  $\frac{3}{5}$ , the probability of lightning is  $\frac{2}{5}$ , and the probability of both is  $\frac{1}{5}$ . What is the probability of a sporting event being cancelled due to rain or lightning?
10. A bag contains cards numbered from 1 to 14. One card is drawn at random. Find the probability of:
  - a) selecting a prime number or a multiple of four.
  - b) selecting a multiple of two or a multiple of three.
  - c) selecting a 3 or a 4.
  - d) selecting an 8 or a number less than 8.

Solutions:

1. mutually exclusive;  $P(A) = 4/13$ ;  $P(B) = 6/13$ ;  $P(A \text{ or } B) = 4/13 + 6/13 = 10/13$

2. non- mutually exclusive;  $P(A) = 15/27$ ;  $P(B) = 11/27$ ;  $P(A \& B) = 6/27$   
 $P(A \text{ or } B) = 15/27 + 11/27 - 6/27 = 20/27$

3. mutually exclusive;  $P(A) = 4/52$ ;  $P(B) = 4/52$ ;  $P(A \text{ or } B) = 8/52 = 2/13$

4. non mutually exclusive;  $P(A) = 5/6$ ;  $P(B) = 9/10$ ;  $P(A \& B) = 4/5$   
 $P(A \text{ or } B) = 5/6 + 9/10 - 4/5 = 14/15$

5. non -mutually exclusive;  $P(A) = 1/6$ ;  $P(B) = 1/6$ ;  $P(A \& B) = 1/36$   
 $P(A \text{ or } B) = 1/6 + 1/6 - 1/36 = 11/36$

6. non-mutually exclusive;  $P(A) = 4/52$ ;  $P(B) = 26/52$ ;  $P(A \& B) = 2/52$   
 $P(A \text{ or } B) = 4/52 + 26/52 - 2/52 = 28/52 = 7/13$

7. non-mutually exclusive;  $P(A) = 26/52$ ;  $P(B) = 12/52$ ;  $P(A \& B) = 6/52$   
 $P(A \text{ or } B) = 26/52 + 12/52 - 6/52 = 32/52 = 8/13$

8. mutually exclusive;  $P(A) = 5/36$ ;  $P(B) = 4/36$   
 $P(A \text{ or } B) = 9/36 = 1/4$

9. non- mutually exclusive;  $P(A) = 3/5$ ;  $P(B) = 2/5$ ;  $P(A \& B) = 1/5$   
 $P(A \text{ or } B) = 3/5 + 2/5 - 1/5 = 4/5$

10.

a) mutually exclusive;  $P(A) = 6/14$ ;  $P(B) = 3/14$   
 $P(A \text{ or } B) = 9/14$

b) non-mutually exclusive;  $P(A) = 7/14$ ;  $P(B) = 4/14$ ;  $P(A \& B) = 2/14$   
 $P(A \text{ or } B) = 7/14 + 4/14 - 2/14 = 9/14$

c) mutually exclusive;  $P(A) = 1/14$ ;  $P(B) = 1/14$   
 $P(A \text{ or } B) = 2/14 = 1/7$

d) mutually exclusive;  $P(A) = 1/14$ ;  $P(B) = 7/14$   
 $P(A \text{ or } B) = 8/14 = 4/7$