

**Probability Homework- Independent verses Dependent**

Name \_\_\_\_\_ Date: \_\_\_\_\_ Period. \_\_\_\_\_

Decide whether the events are independent or dependent. Explain your reasoning.

1. Selecting an ace from a deck of cards, replacing it, and then selecting an ace from the deck.
2. The life span of Mark, a 55 year old man, is 10.2 years. The life span of Marisa, a 26 year old woman, is 50.4 years.
3. Studying for an exam and passing the exam.

Find the probabilities for the given situations:

4. In a deck of 52 cards, two cards are drawn, without replacement:
  - a. Find the probability that both are jacks.
  - b. Find the probability that the first is a queen and the second is a king.
5. In a deck of 52 cards, two cards are drawn, with replacement:
  - a. Find the probability that both are aces
  - b. Find the probability that the first is a 7 and the second is a red card
6. A box contains 5 red marbles, 4 blue marbles and 6 green marbles:
  - a. Find the probability that two marbles are drawn, without replacement, and both are red.
  - b. Find the probability that two marbles are drawn, with replacement, and both are green.
  - c. Find the probability that two marbles are drawn, without replacement, and one is blue and one is red.

7. The table below shows the ages of teachers by departments in a local high school:

	21 – 30 years	31 – 40 years	41 – 50 years	51 – 60 years	Total
Science	2	3	4	1	10
Math	3	5	2	2	12
English	4	6	4	1	15
Social Studies	5	3	3	2	13
Total	14	17	13	6	50

- a. Find the probability that a randomly selected teacher is 41 to 50 years old?
- b. Find the probability that a randomly selected teacher is a 51- 60 year old Social Studies teacher?
- c. Given that a teacher is 21 – 30 years old, find the probability he/she is an English teacher?
- d. Given that a teacher is 31- 40 years old, find the probability that he/she is a Science teacher?
8. The probability that the driver of a car wears a seat belt is 82%. What is the probability that the next three cars will have drivers wearing seat belts?
9. The probability that it will rain is 34%. What is the probability that it will **not** rain over the next two days?

## Probability Review

Name

Key

Date:

Period:

Decide whether the events are independent or dependent. Explain your reasoning.

1. Selecting an ace from a deck of cards, replacing it, and then selecting an ace from the deck.

Independent

2. The life span of Mark, a 55 year old man, is 10.2 years. The life span of Marisa, a 26 year old woman, is 50.4 years.

Independent

3. Studying for an exam and passing the exam.

Dependent

Find the probabilities for the given situations:

4. In a deck of 52 cards, two cards are drawn, without replacement:

- a. Find the probability that both are jacks.

$$4/52 \cdot 3/51 = 1/221 = .45\%$$

- b. Find the probability that the first is a queen and the second is a king.

$$4/52 \cdot 4/51 = 4/663 = .6\%$$

5. In a deck of 52 cards, two cards are drawn, with replacement:

- a. Find the probability that both are aces

$$4/52 \cdot 4/52 = 1/169 = .6\%$$

- b. Find the probability that the first is a 7 and the second is a red card

$$4/52 \cdot 26/52 = 1/26 = 3.8\%$$

6. A box contains 5 red marbles, 4 blue marbles and 6 green marbles: (15 total)

- a. Find the probability that two marbles are drawn, without replacement, and both are red.

$$5/15 \cdot 4/14 = 2/21 = 9.5\%$$

- b. Find the probability that two marbles are drawn, with replacement, and both are green.

$$6/15 \cdot 6/15 = 4/25 = 16\%$$

- c. Find the probability that two marbles are drawn, without replacement, and one is blue and one is red.

$$4/15 \cdot 5/14 = 2/21 = 9.5\%$$

7. The table below shows the ages of teachers by departments in our high school:

	21 – 30 years	31 – 40 years	41 – 50 years	51 – 60 years	Total
Science	2	3	4	1	10
Math	3	5	2	2	12
English	4	6	4	1	15
Social Studies	5	3	3	2	13
Total	14	17	13	6	50

a. Find the probability that a randomly selected teacher is 41 to 50 years old?

$$13/50 = .26 = 26\%$$

b. Find the probability that a randomly selected teacher is a 51- 60 year old Social Studies teacher?

$$2/50 = .04 = 4\% \\ \text{or } 1/25$$

c. Given that a teacher is 21 – 30 years old, find the probability he/she is an English teacher?

$$4/14 = .286 = 28.6\% \\ \text{or } 2/7$$

d. Given that a teacher is 31- 40 years old, find the probability that he/she is a Science teacher?

$$3/17 = .176 = 17.6\%$$

8. The probability that the driver of a car wears a seat belt is 82%. What is the probability that the next three cars will have drivers wearing seat belts?

$$.82 \times .82 \times .82 = 55\%$$

66% NOT RAIN

9. The probability that it will rain is 34%. What is the probability that it will not rain over the next two days?

$$.66 \cdot .66 = .436 = 43.6\%$$