

Hypothesis Testing of Two Means and Two Proportions: Review

Questions 1 – 3 refer to the following:

In a survey at Kirkwood Ski Resort the following information was recorded:

Sport Participation by Age				
	0 – 10	11 - 20	21 - 40	40+
Ski	10	12	30	8
Snowboard	6	17	12	5

Suppose that one person from the above was randomly selected.

EXERCISE 1

Find the probability that the person was a skier or was age 11 – 20.

EXERCISE 2

Find the probability that the person was a snowboarder given he/she was age 21 – 40.

EXERCISE 3

Explain which of the following are true and which are false.

- a. Sport and Age are independent events.
- b. Ski and age 11 – 20 are mutually exclusive events.
- c. $P(\text{Ski and age } 21 - 40) < P(\text{Ski} \mid \text{age } 21 - 40)$
- d. $P(\text{Snowboard or age } 0 - 10) < P(\text{Snowboard} \mid \text{age } 0 - 10)$

EXERCISE 4

The average length of time a person with a broken leg wears a cast is approximately 6 weeks. The standard deviation is about 3 weeks. Thirty people who had recently healed from broken legs were interviewed. State the distribution that most accurately reflects total time to heal for the thirty people.

EXERCISE 5

The distribution for X is Uniform. What can we say for certain about the distribution for \bar{X} when $n = 1$?

- a. The distribution for \bar{X} is still Uniform with the same mean and standard dev. as the distribution for X .
- b. The distribution for \bar{X} is Normal with the different mean and a different standard deviation as the distribution for X .
- c. The distribution for \bar{X} is Normal with the same mean but a larger standard deviation than the distribution for X .
- d. The distribution for \bar{X} is Normal with the same mean but a smaller standard deviation than the distribution for X .

EXERCISE 6

The distribution for X is Uniform. What can we say for certain about the distribution for ΣX when $n = 50$?

- a. The distribution for ΣX is still Uniform with the same mean and standard deviation as the distribution for X .
- b. The distribution for ΣX is Normal with the same mean but a larger standard deviation as the distribution for X .
- c. The distribution for ΣX is Normal with a larger mean and a larger standard deviation than the distribution for X .
- d. The distribution for ΣX is Normal with the same mean but a smaller standard deviation than the distribution for X .

Questions 7 – 9 refer to the following:

A group of students measured the lengths of all the carrots in a five-pound bag of baby carrots. They calculated the average length of baby carrots to be 2.0 inches with a standard deviation of 0.25 inches. Suppose we randomly survey 16 five-pound bags of baby carrots.

EXERCISE 7

State the approximate distribution for \bar{X} , the distribution for the average lengths of baby carrots in 16 five-pound bags. $\bar{X} \sim$

EXERCISE 8

Explain why we cannot find the probability that one individual randomly chosen carrot is greater than 2.25 inches.

EXERCISE 9

Find the probability that \bar{X} is between 2 and 2.25 inches.

Questions 10 – 12 refer to the following:

At the beginning of the term, the amount of time a student waits in line at the campus store is normally distributed with a mean of 5 minutes and a standard deviation of 2 minutes.

EXERCISE 10

Find the 90th percentile of waiting time in minutes.

EXERCISE 11

Find the median waiting time for one student.

EXERCISE 12

Find the probability that the average waiting time for 40 students is at least 4.5 minutes.