CONFIDENCE INTERVALS: REVIEW[*]

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The next three problems refer to the following situation: Suppose that a sample of 15 randomly chosen people were put on a special weight loss diet. The amount of weight lost, in pounds, follows an unknown distribution with mean equal to 12 pounds and standard deviation equal to 3 pounds. Assume that the distribution for the weight loss is normal.

Exercise 1 *(Solution on p. 5.)*

To find the probability that the mean amount of weight lost by 15 people is no more than 14 pounds, the random variable should be:

A. The number of people who lost weight on the special weight loss diet
B. The number of people who were on the diet
C. The mean amount of weight lost by 15 people on the special weight loss diet
D. The total amount of weight lost by 15 people on the special weight loss diet

Exercise 2 *(Solution on p. 5.)*

Find the probability asked for in the previous problem.

Exercise 3 *(Solution on p. 5.)*

Find the 90th percentile for the mean amount of weight lost by 15 people.

The next three questions refer to the following situation: The time of occurrence of the first accident during rush-hour traffic at a major intersection is uniformly distributed between the three hour interval 4 p.m. to 7 p.m. Let $X =$ the amount of time (hours) it takes for the first accident to occur.

- So, if an accident occurs at 4 p.m., the amount of time, in hours, it took for the accident to occur is $_____$.
- $\mu = _____$
- $\sigma^2 = _____$

Exercise 4 *(Solution on p. 5.)*

What is the probability that the time of occurrence is within the first half-hour or the last hour of the period from 4 to 7 p.m.?

A. Cannot be determined from the information given
B. $\frac{1}{6}$
C. $\frac{1}{2}$
D. $\frac{1}{3}$

Exercise 5   *(Solution on p. 5.)*
 The 20th percentile occurs after how many hours?

 A. 0.20
 B. 0.60
 C. 0.50
 D. 1

Exercise 6   *(Solution on p. 5.)*
 Assume Ramon has kept track of the times for the first accidents to occur for 40 different days.
Let $C =$ the total cumulative time. Then C follows which distribution?

 A. $U(0,3)$
 B. $\text{Exp}\left(\frac{1}{3}\right)$
 C. $N(60, 5.477)$
 D. $N(1.5, 0.01875)$

Exercise 7   *(Solution on p. 5.)*
 Using the information in question #6, find the probability that the total time for all first accidents
to occur is more than 43 hours.

 The next two questions refer to the following situation: The length of time a parent must wait
for his children to clean their rooms is uniformly distributed in the time interval from 1 to 15 days.

Exercise 8   *(Solution on p. 5.)*
 How long must a parent expect to wait for his children to clean their rooms?

 A. 8 days
 B. 3 days
 C. 14 days
 D. 6 days

Exercise 9   *(Solution on p. 5.)*
 What is the probability that a parent will wait more than 6 days given that the parent has already
waited more than 3 days?

 A. 0.5174
 B. 0.0174
 C. 0.7500
 D. 0.2143

 The next five problems refer to the following study: Twenty percent of the students at a local
community college live in within five miles of the campus. Thirty percent of the students at the same
community college receive some kind of financial aid. Of those who live within five miles of the campus, 75%
receive some kind of financial aid.

Exercise 10   *(Solution on p. 5.)*
 Find the probability that a randomly chosen student at the local community college does not live
within five miles of the campus.

 A. 80%
 B. 20%
 C. 30%
 D. Cannot be determined

Exercise 11   *(Solution on p. 5.)*
Find the probability that a randomly chosen student at the local community college lives within
five miles of the campus or receives some kind of financial aid.

A. 50%
B. 35%
C. 27.5%
D. 75%

Exercise 12   *(Solution on p. 5.)*
Based upon the above information, are living in student housing within five miles of the campus
and receiving some kind of financial aid mutually exclusive?

A. Yes
B. No
C. Cannot be determined

Exercise 13   *(Solution on p. 5.)*
The interest rate charged on the financial aid is _ _ _ _ _ _ _ data.

A. quantitative discrete
B. quantitative continuous
C. qualitative discrete
D. qualitative

Exercise 14   *(Solution on p. 5.)*
What follows is information about the students who receive financial aid at the local community
college.

- 1st quartile = $250
- 2nd quartile = $700
- 3rd quartile = $1200

(These amounts are for the school year.) If a sample of 200 students is taken, how many are
expected to receive $250 or more?

A. 50
B. 250
C. 150
D. Cannot be determined

The next two problems refer to the following information: $P(A) = 0.2$, $P(B) = 0.3$, A and B
are independent events.

Exercise 15   *(Solution on p. 5.)*
$P(A \text{ AND } B) =$

A. 0.5
B. 0.6
C. 0
D. 0.06

Exercise 16   *(Solution on p. 5.)*
$P(A \text{ OR } B) =$

A. 0.56

B. 0.5

C. 0.44

D. 1

Exercise 17   *(Solution on p. 5.)*

If H and D are mutually exclusive events, $P(H) = 0.25$, $P(D) = 0.15$, then $P(H|D)$

A. 1

B. 0

C. 0.40

D. 0.0375

Solutions to Exercises in this Module

Solution to Exercise (p. 1)
 C

Solution to Exercise (p. 1)
 0.9951

Solution to Exercise (p. 1)
 12.99

Solution to Exercise (p. 1)
 C

Solution to Exercise (p. 2)
 B

Solution to Exercise (p. 2)
 C

Solution to Exercise (p. 2)
 0.9990

Solution to Exercise (p. 2)
 A

Solution to Exercise (p. 2)
 C

Solution to Exercise (p. 2)
 A

Solution to Exercise (p. 3)
 B

Solution to Exercise (p. 3)
 B

Solution to Exercise (p. 3)
 B

Solution to Exercise (p. 3)

C. 150

Solution to Exercise (p. 3)
 D

Solution to Exercise (p. 3)
 C

Solution to Exercise (p. 4)
 B