DISCRETE RANDOM VARIABLES: REVIEW

Questions 1 – 2 refer to the following:

A recent poll concerning credit cards found that 35 percent of respondents use a credit card that gives them a mile of air travel for every dollar they charge. Thirty percent of the respondents charge more than $2000 per month. Of those respondents who charge more than $2000, 80 percent use a credit card that gives them a mile of air travel for every dollar they charge.

EXERCISE 1

What is the probability that a randomly selected respondent expected to spend more than $2000 AND use a credit card that gives them a mile of air travel for every dollar they charge?

A. (0.30)(0.35)
B. (0.80)(0.35)
C. (0.80)(0.30)
D. (0.80)

EXERCISE 2

Based upon the above information, are using a credit card that gives a mile of air travel for each dollar spent AND charging more than $2000 per month independent events?

A. Yes
B. No, and they are not mutually exclusive either
C. No, but they are mutually exclusive
D. Not enough information given to determine the answer

EXERCISE 3

A sociologist wants to know the opinions of employed adult women about government funding for day care. She obtains a list of 520 members of a local business and professional women's club and mails a questionnaire to 100 of these women selected at random. 68 questionnaires are returned. What is the population in this study?

A. All employed adult women
B. All the members of a local business and professional women's club

C. The 100 women who received the questionnaire
D. All employed women with children

Questions 4 – 5 refer to the following: An article from *The San Jose Mercury News* was concerned with the racial mix of the 1500 students at Prospect High School in Saratoga, CA. The table summarizes the results. (Male and female values are approximate.)

			Ethnic Group		
Gender	**White**	**Asian**	**Hispanic**	**Black**	**American Indian**
Male	400	168	115	35	16
Female	440	132	140	40	14

EXERCISE 4

Find the probability that a student is Asian **or** Male.

EXERCISE 5

Find the probability that a student is Black given that the student is Female.

EXERCISE 6

A sample of pounds lost, in a certain month, by individual members of a weight reducing clinic produced the following statistics:

- Mean = 5 lbs.
- Median = 4.5 lbs.
- Mode = 4 lbs.
- Standard deviation = 3.8 lbs.
- First quartile = 2 lbs.
- Third quartile = 8.5 lbs.

The correct statement is:

A. One fourth of the members lost exactly 2 pounds.
B. The middle fifty percent of the members lost from 2 to 8.5 lbs.
C. Most people lost 3.5 to 4.5 lbs.
D. All of the choices above are correct.

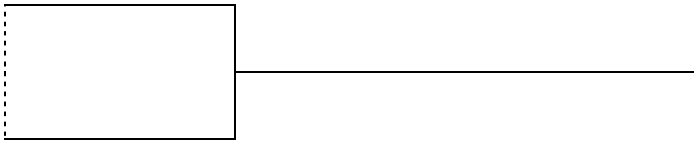
EXERCISE 7

What does it mean when a data set has a standard deviation equal to zero?

A. All values of the data appear with the same frequency.
B. The mean of the data is also zero.
C. All of the data have the same value.
D. There are no data to begin with.

EXERCISE 8

The statement that best describes the illustration is:



A. The mean is equal to the median.
B. There is no first quartile.
C. The lowest data value is the median.
D. The median equals (Q1 + Q3)/2

EXERCISE 9

According to a recent article (*San Jose Mercury News*) the average number of babies born with significant hearing loss (deafness) is approximately 2 per 1000 babies in a healthy baby nursery. The number climbs to an average of 30 per 1000 babies in an intensive care nursery.

Suppose that 1000 babies from healthy nursery babies were surveyed. Find the probability that exactly 2 babies were born deaf.

EXERCISE 10

A "friend" offers you the following "deal." For a $10 fee, you may pick an envelope from a box containing 100 seemingly identical envelopes. However, each envelope contains a coupon for a free gift.

- 10 of the coupons are for a free gift worth $6.
- 80 of the coupons are for a free gift worth $8.
- 6 of the coupons are for a free gift worth $12.
- 4 of the coupons are for a free gift worth $40.

Based upon the financial gain or loss over the long run, should you play the game?

A. Yes, I expect to come out ahead in money.
B. No, I expect to come out behind in money.
C. It doesn't matter. I expect to break even.

Questions 11 – 14 refer to the following: Recently, a nurse commented that when a patient calls the medical advice line claiming to have *the flu*, the chance that he/she truly has *the flu* (and not just a nasty cold) is only about 4%. Of the next 25 patients calling in claiming to have *the flu*, we are interested in how many actually have *the flu*.

EXERCISE 11

Define the Random Variable and list its possible values.

EXERCISE 12

State the distribution of X.

EXERCISE 13

Find the probability that at least 4 of the 25 patients actually have *the flu*.

EXERCISE 14

On average, for every 25 patients calling in, how many do you expect to have *the flu*?

Questions 15 & 16 refer to the following: Different types of writing can sometimes be distinguished by the number of letters in the words used. A student interested in this fact wants to study the number of letters of words used by Tom Clancy in his novels. She opens a Clancy novel at random and records the number of letters of the first 250 words on the page.

EXERCISE 15

What kind of data was collected?

A. qualitative
B. quantitative - continuous
C. quantitative – discrete

EXERCISE 16

What is the population under study?