Mean and Standard Deviation of Random Variables Quiz

1. The following table shows the probability distribution for the number of books a student typically buys at the annual book fair held at an elementary school.

Number of Books	0	1	2	3	4	5	6	7
Probability	0.35	0.20	0.15	0.10	0.07	0.08	0.04	0.01

Let the random variable B represent the number of books a student buys at the next book fair. What is the expected value of B ?

(A) 0

(B) 1.00

(C) 1.79

(D) 3.50

(E) 28

2. At a certain bakery, the price of each doughnut is \$1.50. Let the random variable D represent the number of doughnuts a typical customer purchases each day. The expected value and variance of the probability distribution of D are 2.6 doughnuts and 3.6 $(\text{doughnuts})^2$, respectively. Let the random variable P represent the price of the doughnuts that a typical customer purchases each day. Which of the following is the standard deviation, in dollars, of the probability distribution of P ?

(A) $1.5(3.6)$

(B) $1.5\sqrt{3.6}$

(C) $\sqrt{1.5(3.6)}$

(D) $1.5(2.6)$

(E) $1.5\sqrt{2.6}$

3. The quality control manager at a factory records the number of equipment breakdowns each day. Let the random variable Y represent the number of breakdowns in one day. The standard deviation of Y is 0.28. Which of the following is the best interpretation of the standard deviation?

(A) The number of breakdowns on a randomly selected day is expected to be 0.28.

(B) The number of breakdowns on a randomly selected day will be 0.28 away from the mean.

(C) The average number of breakdowns per day for a random sample of days is expected to be 0.28.

(D) On average, the number of breakdowns per day varies from the mean by about 0.28.

(E) The number of breakdowns per day for a random sample of days is expected to be 0.28 away from the mean.

4. Data were collected on the number of days per week that members visit a certain fitness center. The values varied from 0 to 7, and a distribution of relative frequencies for the values was created. Let the random variable X represent the number of days per week that a member visits. The mean of X is 3.12. Which of the following statements is the best interpretation of the mean?

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(A) Each member visits the fitness center 3 or 4 days per week.

(B) The average number of days that each member visits the fitness center is 3.12 days per week.

(C) Half the members visit the fitness center 3 days per week or less, and the other half visit 4 days per week or more.

(D) The long-run average resulting from repeated sampling of members of the fitness center will approach 3.12 days per week.

(E) For a random sample of members selected from the population, the average number of visits for the sample will be 3.12 days per week.

5. Let the random variable Q represent the number of students who go to a certain teacher's office hour each day. The standard deviation of Q is 2.2. Which of the following is the best interpretation of the standard deviation?

(A) On average, the number of students going to an office hour varies from the mean by about 2.2 students.

(B) For a randomly selected office hour, the number of students who will go is 2.2.

(C) For a randomly selected office hour, the number of students expected to go will vary from the mean by 2.2 students.

(D) For a random selection of office hours, the average number of students expected to go is 2.2.

(E) For a random selection of office hours, the average number of students expected to go will vary from the mean by 2.2 students.

6. For a certain dog breed, the number of puppies in a litter typically varies from 2 to 6. The following table shows the probability distribution of the random variable N, where N represents the number of puppies in a litter. Also shown are the squared deviations, or distances, from the expected value of 4.5 for the distribution.

Number of puppies	2	3	4	5	6
Squared deviation	6.25	2.25	0.25	0.25	2.25
Probability	0.05	0.15	0.25	0.35	0.20

What is the variance of the distribution?

(A) 1.12

(B) 1.25

(C) 1.41

(D) 1.58

(E) 2.25