1. Sleazy P. Martini has a crooked, six-sided die.

Let $X$ = the number on the face of the die

Let $P(X = x)$ = the probability of rolling $x$.

Use the table below to answer the following question.

| $x$ | $P(X = x)$ |
|---|---|
| 1 | 0.1867 |
| 2 | 0.1367 |
| 3 | 0.2267 |
| 4 | 0.1067 |
| 5 | 0.1967 |
| 6 | 0.1467 |

What is the long-term average of the rolled face value of Sleazy P.'s die? Round your answer to four decimal places.

A. $\mu = 3.43$.

B. $\mu = 3.45$.

C. $\mu = 3.38$.

D. $\mu = 3.44$.

E. $\mu = 3.46$.

F. $\mu = 3.4$.

G. $\mu = 3.41$.

H. $\mu = 3.39$.

2. A hospital researcher is interested in the number of times the average post-op patient will ring the nurse during a 12-hour shift. For a random sample of 50 patients, the following information was obtained.

| $x$ | $P(X = x)$ |
|---|---|
| 0 | $\frac{3}{25}$ |
| 1 | $\frac{3}{25}$ |
| 2 | $\frac{9}{25}$ |
| 3 | $\frac{6}{25}$ |
| 4 | $\frac{7}{50}$ |
| 5 | $\frac{1}{50}$ |

where $X$ = the number of times a patient rings the nurse during a 12-hour shift.

For this exercise, $x = 0, 1, 2, 3, 4, 5$.

$P(X = x)$ = the probability that $X$ takes on value $x$.

Use the above PDF table to find the expected value $\mu$ of this distribution. Round your answer to two decimal places.

A. $\mu = 2.27$.

B. $\mu = 2.26$.

C. $\mu = 2.25$.

D. $\mu = 2.17$.

E. $\mu = 2.18$.

F. $\mu = 2.22$.

G. $\mu = 2.23$.

H. $\mu = 2.21$.

3. A hospital researcher is interested in the number of times the average post-op patient will ring the nurse during a 12-hour shift. For a random sample of 50 patients, the following information was obtained.

| $x$ | $P(X = x)$ |
|---|---|
| 0 | $\frac{3}{25}$ |
| 1 | $\frac{3}{25}$ |
| 2 | $\frac{9}{25}$ |
| 3 | $\frac{6}{25}$ |
| 4 | $\frac{7}{50}$ |
| 5 | $\frac{1}{50}$ |

where $X$ = the number of times a patient rings the nurse during a 12-hour shift.

For this exercise, $x = 0, 1, 2, 3, 4, 5$.

$P(X = x)$ = the probability that $X$ takes on value $x$.

What is the long-term average of the number of calls a patient makes on a 12-hour shift? Round your answer to two decimal places.

A. During a 12-hour shift, a patient rings 2.17 times on average.

B. During a 12-hour shift, a patient rings 2.25 times on average.

C. During a 12-hour shift, a patient rings 2.27 times on average.

D. During a 12-hour shift, a patient rings 2.19 times on average.

E. During a 12-hour shift, a patient rings 2.23 times on average.

F. During a 12-hour shift, a patient rings 2.18 times on average.

G. During a 12-hour shift, a patient rings 2.22 times on average.

H. During a 12-hour shift, a patient rings 2.21 times on average.

4. Linda Lou offers Billy Bob to play a game which involves selecting a card from a regular 52-card deck and tossing a coin. The coin is a fair coin and is equally likely to land on heads or tails.

If the card is a face card, and the coin lands on Heads, Billy Bob wins $7

If the card is a face card, and the coin lands on Tails, Billy Bob wins $3

If the card is not a face card, Billy Bob loses $3, no matter what the coin shows.

If Billy Bob were to play this game repeatedly, what is the long-term average of Billy Bob's winnings? Round your answer to the nearest cent.

A. The long term average of Billy Bob's winnings is -$1.25.

B. The long term average of Billy Bob's winnings is -$1.55.

C. The long term average of Billy Bob's winnings is -$1.15.

D. The long term average of Billy Bob's winnings is -$0.75.

E. The long term average of Billy Bob's winnings is -$1.65.

F. The long term average of Billy Bob's winnings is -$0.95.

G. The long term average of Billy Bob's winnings is -$0.85.

H. The long term average of Billy Bob's winnings is -$1.45.

5. Sleazy P. Martini has a crooked, six-sided die.

Let $X$ = the number on the face of the die

Let $P(X = x)$ = the probability of rolling $x$.

| $x$ | $P(X = x)$ |
|---|---|
| 1 | 0.1767 |
| 2 | 0.2167 |
| 3 | 0.2567 |
| 4 | 0.0767 |
| 5 | 0.1167 |
| 6 | 0.1567 |

The expected value of the PDF described by the above table is $\mu = 3.21$. Use the table to find the standard deviation $\sigma$ of of Sleazy P.'s die. Round your answer to four decimal places.

A. $\sigma = 1.6932$.

B. $\sigma = 1.6332$.

C. $\sigma = 1.6732$.

D. $\sigma = 1.7332$.

E. $\sigma = 1.6432$.

F. $\sigma = 1.7132$.

G. $\sigma = 1.6532$.

H. $\sigma = 1.6832$.

6. A random variable $X$ has a PDF described by the following table.

| $x$ | $P(X = x)$ |
|---|---|
| 0 | 0.11 |
| 3 | 0.44 |
| 6 | 0.36 |
| 9 | 0.09 |

Find the expected value $\mu$ of this distribution. Round your answer to two decimal places.

A. $\mu = 4.28$.

B. $\mu = 4.32$.

C. $\mu = 4.31$.

D. $\mu = 4.34$.

E. $\mu = 4.25$.

F. $\mu = 4.29$.

G. $\mu = 4.26$.

H. $\mu = 4.24$.

7. Suppose Sleazy P. Martini has an unfair coin with $P(\text{Heads}) = 0.58$ and $P(\text{Tails}) = 0.42$ and offers you to play the following game:

If the coin comes up heads, you pay Sleazy P. \$6.

If it comes up tails, Sleazy P. pays you \$10.

On the average, is this a game you want to play?

A. Yes. You want to play this game.

B. No. You don't want to play this game.

8. A company wants to evaluate its attrition rate, in other words, how long new hires stay with the company. Over the years, they have established the following probability distribution.

Let $X$ = the number of years a new hire will stay with the company.

Let $P(X = x)$ = the probability that a new hire will stay with the company $x$ years.

Use the table below to answer the following question.

| $x$ | $P(X = x)$ |
|---|---|
| 0 | 0.24 |
| 1 | 0.18 |
| 2 | 0.01 |
| 3 | 0.05 |
| 4 | 0.27 |
| 5 | 0.21 |
| 6 | 0.04 |

The expected value of the PDF described by the above table is $\mu = 2.72$. Use this table to find the standard deviation $\sigma$ of this distribution. Round your answer to two decimal places.

A. $\sigma = 2.07$.

B. $\sigma = 2.11$.

C. $\sigma = 2.09$.

D. $\sigma = 2.08$.

E. $\sigma = 2.06$.

F. $\sigma = 2.03$.

G. $\sigma = 2.02$.

H. $\sigma = 2.04$.