✖

Lesson 3.1

Back to Week 1

✓ **10/10** points
earned (100%)

Quiz passed!

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✓   1 / 1
points

1.
When using random variable notation, big X denotes _____.

⭘   a random variable

▲

Correct Response

⭘

○ a conditional probability

○ distributed as

○ a realization of a random variable

○ the expectation of a random variable

○ approximately equal to

✔ 1 / 1
   points

2.

When using random variable notation, little x denotes _____.

○ a random variable

○ a conditional probability

○ distributed as

◉ a realization of a random variable

Correct Response
It is a possible value the random variable can take

○ the expectation of a random variable

○ approximately equal to

✔ 1 / 1
points

3.

When using random variable notation, X ~ denotes _____.

○ a random variable

○ a conditional probability

◉ distributed as

Correct Response

○ a realization of a random variable

○ the expectation of a random variable

○ approximately equal to

✔ 1 / 1
points

4. What is the value of $f(x) = -5I_{\{x>2\}}(x) + xI_{\{x<-1\}}(x)$ when $x = 3$?

-5

Correct Response

Only the first term is evaluated as non-zero.

✔   1 / 1
     points

5. What is the value of $f(x) = -5I_{\{x>2\}}(x) + xI_{\{x<-1\}}(x)$ when $x = 0$?

> 0

Correct Response
All indicator functions evaluate to zero.

✔   1 / 1
     points

6.
Which of the following scenarios could we appropriately model using a Bernoulli random variable?

⦿ Predicting whether your hockey team wins its next game (tie counts as a loss)

Correct Response
Whether they win is a binary outcome which can only take on values $\{0, 1\}$.

○ Predicting the weight of a typical hockey player

○ Predicting the number of goals scored in a hockey match

○   Predicting the number of wins in a series of three games against a single opponent (ties count as losses)

✓   1 / 1
      points

7.

Calculate the expected value of the following random variable: X takes on values $\{0, 1, 2, 3\}$ with corresponding probabilities $\{0.5, 0.2, 0.2, 0.1\}$. Round your answer to one decimal place.

> 0.9

Correct Response
This is $0(.5) + 1(.2) + 2(.2) + 3(.1)$.

✓   1 / 1
      points

8.

Which of the following scenarios could we appropriately model using a binomial random variable (with n > 1)?

○   Predicting whether your hockey team wins its next game (tie counts as a loss)

○   Predicting the weight of a typical hockey player

○   Predicting the number of goals scored in a hockey match

◉   Predicting the number of wins in a series of three games against a single opponent (ties count as losses)

Correct Response

The binomial model assumes a fixed number of independent trials, each with the same probability of success.

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1 / 1
points

9. Suppose $X \sim \text{Binomial}(3, 0.2)$. Calculate $P(X = 0)$. Round your answer to two decimal places.

> 0.512

Correct Response

This is $P(X = 0) = \binom{3}{0} 0.2^0 0.8^3$.

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1 / 1
points

10. Suppose $X \sim \text{Binomial}(3, 0.2)$. Calculate $P(X \leq 2)$. Round your answer to two decimal places.

> 0.992

Correct Response

This is $P(X = 0) + P(X = 1) + P(X = 2)$

$$= \binom{3}{0} 0.2^0 0.8^3 + \binom{3}{1} 0.2^1 0.8^2 + \binom{3}{2} 0.2^2 0.8^1$$

$$= 1 - P(X = 3)$$