Bookmarks

- Module 1: The Basics of R and Introduction to the Course
- Entrance Survey
- Module 2: Fundamentals of Probability, Random Variables, Distributions, and Joint Distributions
- Module 3: Gathering and Collecting Data, Ethics, and Kernel Density Estimates
- Module 4: Joint, Marginal, and Conditional Distributions & Functions of Random Variable

Summary of Semester So Far - Quiz

Bookmark this page

These questions give a taste of each topic we have covered so far. They are by no means comprehensive.

Question 1

1.0/1.0 point (graded)

1. Which of the following is equal to $P(X|Y)$? (Select all that apply.)

- [x] a. $P(Y|X) * P(X)/P(Y)$
- [x] b. $P(X,Y)/P(Y)$
- [ ] c. $P(X) * P(Y)/P(Y)$
- [ ] d. $P(X|Y) * P(Y)/P(X)$

✔

Explanation

- Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression
- Module 6: Special Distributions, the Sample Mean, the Central Limit Theorem, and Estimation
- Module 7: Assessing and Deriving Estimators - Confidence Intervals, and Hypothesis Testing

Assessing and Deriving Estimators
Finger Exercises due Nov 14, 2016 at 05:00 IST

Confidence Intervals and Hypothesis Testing
Finger Exercises due Nov 14, 2016 at 05:00 IST

Module 7: Homework
Homework due Nov 07, 2016 at 05:00 IST

This question reviews conditional probability and Bayes' Rule. A) and B) are different ways of stating Bayes' Rule and the definition of conditional probability. C) is true in the case that X and Y are independent.

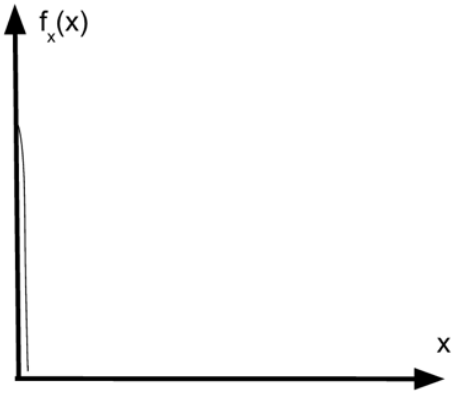
Submit You have used 1 of 2 attempts

Question 2

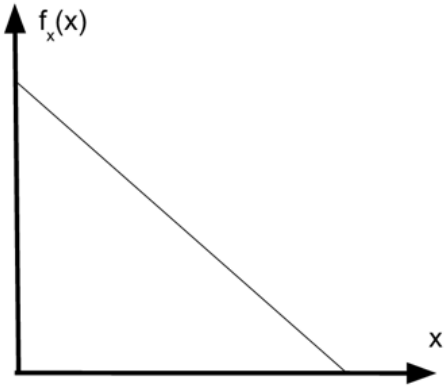
1.0/1.0 point (graded)

PDFs:

PDF A:

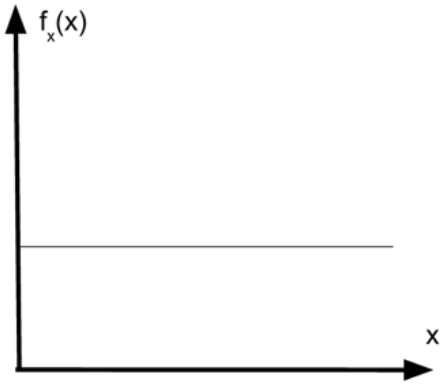


PDF B:

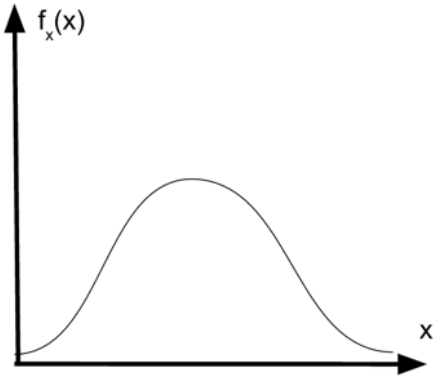


- Exit Survey

PDF C:

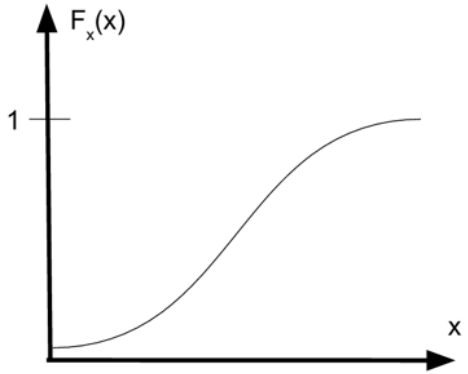


PDF D:

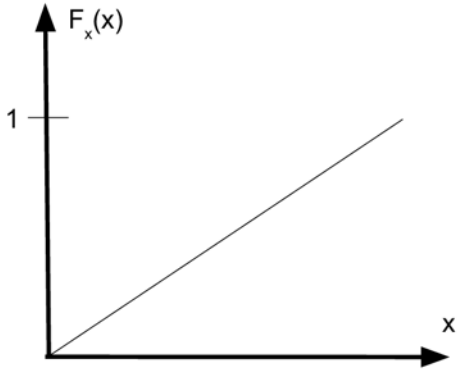


CDFs:

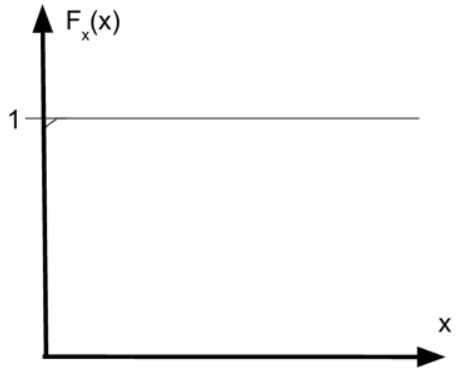
CDF E:



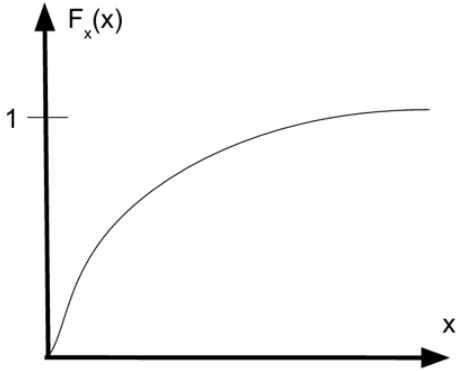
CDF F:



CDF G:



CDF H:



Match the PDFs (probability distribution functions) above with their corresponding CDFs (cumulative distribution functions):

Note: The corresponding label for each graph is at the bottom left

PDF A

g ✔ **Answer:** g

PDF B

h ✔ **Answer:** h

PDF C

f ✔ **Answer:** f

PDF D

e ✔ **Answer:** e

Explanation

The cumulative distribution function represents the probability that the random variable is less than or equal to the argument to the function. It is equal to the area under the probability distribution function. We can integrate the probability distribution function to get the cumulative distribution function.

Submit You have used 1 of 2 attempts

Question 3

1/1 point (graded)

Suppose a coin comes up heads with probability 2/5. What is the mean and variance of the distribution that expresses the number of times the coin comes up heads after 5 tosses?

Mean:

2 ✔ **Answer:** 2

2

Variance:

1.2 ✔ **Answer:** 6/5

1.2

Explanation

Obtaining heads on a coin flip follows a binomial distribution, where $H|N = n \sim B(n, 2/5)$ with H referring to the number "obtaining heads," and N refers to the the number of coin flips.

The expectation for this binomial distribution after 5 tosses is given by: $E[H|N]$, where N =the number of coin flips.$E[H|N = 5] = np = 5(2/5) = 2$. The variance for a binomial distribution is calculated by: $np(1-p)$. For 5 tosses, this will be given as: $5(\frac{2}{5})(1-\frac{2}{5}) = 2(\frac{3}{5}) = \frac{6}{5}$.

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Question 4

1.0/1.0 point (graded)

Which of the following is equal to $E[aX + bY + c]$? (Select all that apply.)

- [x] a. $aE[x] + bE[Y] + c$
- [ ] b. $a^2E[x] + b^2E[Y] + c$
- [x] c. $E[aX] + E[bY] + c$
- [ ] d. $(a + b + c)E[X + Y]$

✔

Explanation

This question reviews properties of expectation. By linearity of expectation, we can add together the expectation of each random variable separately.

Submit You have used 1 of 2 attempts

Question 5

1.0/1.0 point (graded)

Which of the following is equal to $\text{Var}(aX + bY + c)$? (Select all that apply.)

- [ ] a. $a\text{Var}(X) + b\text{Var}(Y)$
- [x] b. $a^2\text{Var}(X) + b^2\text{Var}(Y) + 2ab\text{Cov}(X, Y)$
- [ ] c. $\text{Var}(aX) + \text{Var}(bY) + \text{Var}(c)$
- [ ] d. $(a + b)\text{Var}(X + Y)$

✔

Explanation

This question reviews properties of variance. The variance of a constant is equal to zero.

Submit You have used 1 of 2 attempts

Discussion
Topic: Module 7 / Summary of Semester So Far - Quiz

Show Discussion