



Bookmarks

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Unit overview

Lec. 8: Probability density functions

Exercises 8 due Mar 18, 2016 at 23:59 UTC

Lec. 9: Conditioning on an event; Multiple r.v.'s

Unit 5: Continuous random variables > Problem Set 5 > Problem 4 Vertical: Paul goes to the casino

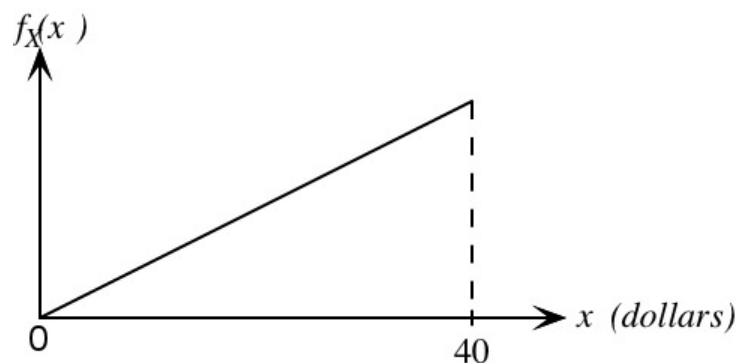


Bookmark

Problem 4: Paul goes to the casino

(7/7 points)

Paul is vacationing in Monte Carlo. On any given night, he takes X dollars to the casino and returns with Y dollars. The random variable X has the PDF shown in the figure. Conditional on $X = x$, the continuous random variable Y is uniformly distributed between zero and $2x$.

1. Determine the joint PDF $f_{X,Y}(x, y)$.If $0 < x < 40$ and $0 < y < 2x$,

$$f_{X,Y}(x, y) = \frac{1}{1600}$$

If $y < 0$ or $y > 2x$,

$$f_{X,Y}(x, y) = 0$$



2. On any particular night, Paul makes a profit of $Z = Y - X$ dollars. Find the probability that Paul makes a positive profit (i.e., $P(Z > 0)$):

$$\frac{1}{2}$$



3. Find the PDF of Z . Express your answers in terms of z using standard notation. Hint: Start by finding $f_{Z|X}(z | x)$.

Exercises 9 due Mar
18, 2016 at 23:59 UTC

Lec. 10:
**Conditioning on a
random variable;
Independence;
Bayes' rule**

Exercises 10 due Mar
18, 2016 at 23:59 UTC

**Standard normal
table**

Solved problems

Problem Set 5

Problem Set 5 due Mar
18, 2016 at 23:59 UTC

Unit summary

- Unit 6: Further topics on random variables

If $0 < z < 40$, $f_Z(z) =$ ✓

If $-40 < z < 0$, $f_Z(z) =$ ✓

If $z < -40$ or $z > 40$, $f_Z(z) =$ ✓

4. What is $\mathbf{E}[Z]$?

$\mathbf{E}[Z] =$ ✓

You have used 3 of 3 submissions

DISCUSSION

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