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Problem 1: Defective coin

(3/3 points)

A defective coin minting machine produces coins whose probability of Heads is a random variable Q with PDF

$$f_Q(q) = \begin{cases} 3q^2, & \text{if } q \in [0, 1], \\ 0, & \text{otherwise.} \end{cases}$$

A coin produced by this machine is tossed repeatedly, with successive tosses assumed to be independent. Let A be the event that the first toss of this coin results in Heads, and let B be the event that the second toss of this coin results in Heads.

1.

$$\mathbf{P}(A) = \boxed{3/4} \quad \checkmark$$

(Your answer should be a number.)

2. Find the conditional PDF of Q given event A . Express your answer in terms of q using standard notation .

$$\text{For } 0 \leq q \leq 1, f_{Q|A}(q) = \boxed{4q^3} \quad \checkmark$$

3.

$$\mathbf{P}(B | A) = \boxed{4/5} \quad \checkmark$$

(Your answer should be a number.)


You have used 2 of 2 submissions

Printable problem set available here .


DISCUSSION

Click "Show Discussion" below to see discussions on this problem.


Unit overview**Lec. 14:
Introduction to
Bayesian inference**

Exercises 14 due Apr
06, 2016 at 23:59 UTC 


**Lec. 15: Linear
models with
normal noise**

Exercises 15 due Apr
06, 2016 at 23:59 UTC 


Problem Set 7a

Problem Set 7a due
Apr 06, 2016 at 23:59
UTC 


**Lec. 16: Least
mean squares
(LMS) estimation**

Exercises 16 due Apr
13, 2016 at 23:59 UTC 

**Lec. 17: Linear
least mean
squares (LLMS)
estimation**

Exercises 17 due Apr
13, 2016 at 23:59 UTC 

Problem Set 7b

Problem Set 7b due
Apr 13, 2016 at 23:59
UTC 

Solved problems**Additional
theoretical
material****Unit summary**

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