

Probability 1
CEU Budapest, fall semester 2013
Imre Péter Tóth
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1. Anne was given three envelopes. One of them contained two black cards, another contained two white cards, while the third one contained a black and a white card. Anne chose an envelope at random, and then drew a card from that envelope at random. She looked at it and saw that it is black.

What is the probability that the other card in the envelope is also black?

2. An absolutely continuous random variable X has density

$$f(x) = \begin{cases} 2x, & \text{if } 0 < x < 1 \\ 0, & \text{if not} \end{cases}$$

(w.r.t. Lebesgue measure on \mathbb{R}).

Calculate the expectation of $Y = X^2$.

3. Bob, while watching the sky on a clear August night, sees, on average, one shooting star every 5 minutes. Given a 15 minute time interval, what is the probability that he will see at least 3 shooting stars in that interval? (Preliminary question: what is the *good model* for the distribution of the number of shooting stars he sees?)