

IMM - DTU

02405 Probability

2004-4-11

BFN/bfn

Question a) With R being

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$$P(R \leq r)$$

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$$P(R \leq r) = F_R(r)$$

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Question a) With R being the distance from the bulls eye to the shot we have (page.360 line b.4)

$$P(R \leq r) = F_R(r) = 1 - e^{-\frac{1}{2}r^2}$$

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$$P(1 \leq R \leq 2)$$

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Question d) This is the probability that the absolute value of the first coordinate is less than or equal to $r = 1.1777\dots$

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$$(2\Phi(r) - 1)$$

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$$(2\Phi(r) - 1) \doteq (2\Phi(1.18) - 1)$$

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$$(2\Phi(r) - 1) \simeq (2\Phi(1.18) - 1) = 0.762$$

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$$(2\Phi(r) - 1) \simeq (2\Phi(1.18) - 1) = 0.762$$

Question e) This is the probability that the absolute value of largest of the two coordinates are less than or equal to r .

$$(2\Phi(r) - 1)^2 \simeq (2\Phi(1.18) - 1)^2 = 0.581$$

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Question f) Use rotational symmetry

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$$\left(2\Phi\left(\frac{r}{\sqrt{2}}\right) - 1\right)^2$$

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Question f) Use rotational symmetry and find similarly to e)

$$(2\Phi\left(\frac{r}{\sqrt{2}}\right) - 1)^2 = 0.352$$

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$$(2\Phi(r) - 1) \simeq (2\Phi(1.18) - 1) = 0.762$$

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Question g)

$$\frac{1}{2}(2\Phi(r) - 1)^2$$

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$$(2\Phi\left(\frac{r}{\sqrt{2}}\right) - 1)^2 = 0.352$$

Question g)

$$\frac{1}{2}(2\Phi(r) - 1)^2 = 0.29$$