

IMM - DTU

02405 Probability  
2006-11-19  
BFN/bfn

Question a) We first derive

$$E(Y|X = x)$$

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$$E(Y|X = x) = \sum_{y=1}^x$$

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$$E(Y|X = x) = \sum_{y=1}^x y \cdot \frac{1}{x}$$

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$$E(Y|X = x) = \sum_{y=1}^x y \cdot \frac{1}{x} = \frac{1}{x}$$

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$$E(Y|X = x) = \sum_{y=1}^x y \cdot \frac{1}{x} = \frac{1}{x} \sum_{y=1}^x y .$$

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Question b)

$$E(Y^2|X = x)$$

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$$\sum_{i=1}^m i^2 = \frac{n(n+1)(2n+1)}{6}$$

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(which we can derive using  $E(X^2) = SD(X)^2 + E(X)^2$  for the uniform distribution page 477 or 487).

Question b)

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$$P(X+Y = 2)$$

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