

IMM - DTU

02405 Probability
2004-5-16
BFN/bfn

Question a) Let X define

IMM - DTU

02405 Probability
2004-5-16
BFN/bfn

Question a) Let X define the number of sixes appearing

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls.

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0)$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3,$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1)$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3},$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2)$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3},$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X)$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x)$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3}$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3}$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X)$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have

$$E(X) = 3 \cdot \frac{1}{6}$$

IMM - DTU

02405 Probability

2004-5-16

BFN/bfn

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have

$$E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}.$$

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}(3, \frac{1}{6})$ example 7 page 169 we have

$$E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}.$$

Question b) Let Y denote the number

Question a) Let X define the number of sixes appearing on three rolls. We find

$$P(X = 0) = \left(\frac{5}{6}\right)^3, P(X = 1) = 3\frac{5^2}{6^3}, P(X = 2) = 3\frac{5}{6^3}, \text{ and } P(X = 3) = \frac{1}{6^3}.$$

Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have

$$E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}.$$

Question b) Let Y denote the number of odd numbers

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls,

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls, then
 $Y \in$

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls, then
 $Y \in \text{binomial}\left(3, \frac{1}{2}\right)$

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls, then
 $Y \in \text{binomial}\left(3, \frac{1}{2}\right)$ thus $E(Y)$

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls, then
 $Y \in \text{binomial}\left(3, \frac{1}{2}\right)$ thus $E(Y) = 3 \cdot \frac{1}{2}$

Question a) Let X define the number of sixes appearing on three rolls. We find
 $P(X = 0) = \left(\frac{5}{6}\right)^3$, $P(X = 1) = 3\frac{5^2}{6^3}$, $P(X = 2) = 3\frac{5}{6^3}$, and $P(X = 3) = \frac{1}{6^3}$.
Using the definition of expectation page 163

$$E(X) = \sum_{x=0}^3 x \mathbb{P}(X = x) = 0 \cdot \left(\frac{5}{6}\right)^3 + 1 \cdot 3\frac{5^2}{6^3} + 2 \cdot 3\frac{5}{6^3} + 3 \cdot \frac{1}{6^3} = \frac{1}{2}$$

or realizing that $X \in \text{binomial}\left(3, \frac{1}{6}\right)$ example 7 page 169 we have
 $E(X) = 3 \cdot \frac{1}{6} = \frac{1}{2}$.

Question b) Let Y denote the number of odd numbers on three rolls, then
 $Y \in \text{binomial}\left(3, \frac{1}{2}\right)$ thus $E(Y) = 3 \cdot \frac{1}{2} = \frac{3}{2}$.