



งานมอบหมายบทที่ 2

วิชา 4105208 Introduction to Probability and Statistics

ชื่อ - สกุล รหัสประจำตัว

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Exercises

2.8-1 An urn contains 7 red and 11 white balls. Draw one ball at random from the urn. Let $X = 1$ if a red ball is drawn, and let $X = 0$ if a white ball is drawn. Give the p.d.f., mean, and variance of X .

2.8-2 Suppose that in Exercise 2.8-1 $X = 1$ if a red ball is drawn, and $X = -1$ if a white ball is drawn. Give the p.d.f., mean, and variance of X .

2.8-3 On a five-question multiple-choice test there are five possible answers, of which one is correct (C) and four are incorrect (I). If a student guesses randomly and independently, find the probability of

- (a) being correct only on questions 1 and 4 (i.e., scoring C, I, I, C, I);
- (b) being correct on two questions.

2.8-4 If X is $b(25, 0.35)$, find the probability of

- (a) at most 11 successes,
- (b) at least 7 successes,
- (c) exactly 8 successes.
- (d) Give the mean and variance of X .

2.8-5 If X is $b(16, 0.75)$, find the probability of

- (a) at least 13 successes,
- (b) at most 11 successes,
- (c) exactly 12 successes.
- (d) Give the mean and variance of X .

2.8-6 It is claimed that 15% of the ducks in a particular region have patent schistosome infection. Suppose that seven ducks are selected at random. Let X equal the number of ducks that are infected.

- (a) Assuming independence, how is X distributed?
- (b) Find (i) $P(X \geq 2)$, (ii) $P(X = 1)$, and (iii) $P(X \leq 3)$.

2.8-7 Suppose that 2000 points are selected independently and at random from the unit squares $S = \{(x, y): 0 \leq x < 1, 0 \leq y < 1\}$. Let W equal the number of points that fall in $A = \{(x, y): x^2 + y^2 < 1\}$.

- (a) How is W distributed?
- (b) Give the mean, variance, and standard deviation of W .

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