

令和5年度入学 総合政策研究科 博士前期課程 一般 2次募集 試験問題の出典

種別	大問 番号	著者名	著作物名	書名等	版元
英語	—	Amir D. Aczel Jayavel Sounderpandian	Complete Business Statistics, 7th edition	2009 P259より 一部改変	The McGraw-Hill Companies, Inc.

岩手県立大学大学院  
総合政策研究科  
博士前期課程

令和5年度(第2次募集)

入学試験問題

英語

志願区分：一般

注意事項：

1. この試験は、13時00分から14時30分までである。
2. 「始め」の合図があるまで、問題を見てはいけません。
3. 試験中に、問題冊子および解答用紙の印刷不鮮明、ページの脱落などがあった場合には、手を挙げて試験監督者に知らせなさい。
4. 解答は、黒鉛筆（シャープペンシルも可）で記入しなさい。万年筆、ボールペン等は使用してはいけません。
5. 試験終了後、問題冊子は持ち帰りなさい。

英語

注意事項：

解答用紙の所定の欄に、志願区分、受験番号および氏名を記入しなさい。

課題文の本文ならびに脚注を読んで以下の問いに答えなさい。

- 1 ジャネット・コリンズ (Janet Collins) はどのようにして有罪判決を受けるに至ったのかを日本語で答えなさい。
- 2 数学教員が犯した致命的なミスとはどういうものだったのかを日本語で答えなさい。
- 3 下線が引かれた部分を和訳しなさい。

On June 18, 1964, a woman was robbed while walking home along an alley in San Pedro, California. Some time later, police arrested Janet Collins and charged her with the robbery. The interesting thing about this case of petty crime is that the prosecution had *no* direct evidence against the defendant. Janet Collins was convicted of robbery on purely statistical grounds.

The case, *People v. Collins*, drew much attention because of its use of probability—or, rather, what was perceived as a probability—in determining guilt. An instructor of mathematics at a local college was brought in by the prosecution and testified as an expert witness in the trial. The instructor “calculated the probability” that the defendant was a person *other* than the one who committed the crime as 1 in 12,000,000. This led the jury to convict the defendant.

The Supreme Court of California later reversed the guilty verdict against Janet Collins when it was shown that the method of calculating the probability was incorrect. The mathematics instructor had made some very serious errors.\*

Despite the erroneous procedure used in deriving the probability, and the justified reversal of the conviction by the Supreme Court of California, the *Collins* case serves as an excellent analogy for statistical hypothesis testing. Under the U.S. legal system, the accused is assumed innocent until proved guilty “beyond a reasonable doubt.” We will call this the *null hypothesis*—the hypothesis that the accused is *innocent*. We will hold the null hypothesis as true until a time when we can prove, beyond a reasonable doubt, that it is false and that the *alternative hypothesis*—the hypothesis that the accused is guilty—is true. We want to have a small probability (preferably *zero*) of convicting an innocent person, that is, of rejecting a null hypothesis when the null hypothesis is actually true.

In the *Collins* case, the prosecution claimed that the accused was guilty since, otherwise, an

event with a very small probability had just been observed. The argument was that if Collins were *not* guilty, then another woman fitting her exact characteristics had committed the crime. According to the prosecution, the probability of this event was 1/12,000,000, and since the probability was so small, Collins was very likely the person who committed the robbery.

The *Collins* case illustrates hypothesis testing, an important application of statistics. A *thesis* is something that has been proven to be true. A *hypothesis* is something that has not yet been proven to be true. Hypothesis testing is the process of determining whether or not a given hypothesis is true.

(Amir D. Aczel and Jayavel Sounderpandian, “*Complete Business Statistics, 7<sup>th</sup> edition*”, The McGraw-Hill Companies, Inc., 2009, p. 259 より一部改変)

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\* The instructor multiplied the probabilities of the separate events comprising the reported description of the robber: the event that a woman has blond hair, the event that she drives a yellow car, the event that she is seen with an African-American man, the event that the man has a beard. Recall that the probability of the intersection of several events is equal to the product of the probabilities of the separate events only if the events are independent. In this case, there was no reason to believe that the events were independent. There were also some questions about how the separate “probabilities” were actually derived since they were presented by the instructor with no apparent justification. See W. Fairley and F. Mosteller, “A Conversation about Collins,” *University of Chicago Law Review* 41, no. 2 (Winter 1974), pp. 242–53.