

1. A set of four cards consists of two red cards and two black cards. The cards are shuffled thoroughly, and I am dealt two cards. I found the number of red cards  $X$  in these two cards. The random variable  $X$  has which of the following probability distributions?

- A. The binomial distribution with parameters  $n = 4$  and  $p = 0.5$ .
  - B. The binomial distribution with parameters  $n = 2$  and  $p = 0.5$ .
  - C. None of the above.
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2. There are five multiple choice questions on an exam, each having responses a, b, c, or d. Each question is worth 5 points and only one option per question is correct. Suppose the student guesses the answer to each question, and his or her guesses from question to question are independent. If the student needs at least 20 points to pass the test, the probability that the student passes is closest to

- A. 0.0146.
  - B. 0.0010.
  - C. 0.0156.
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3. There are five multiple choice questions on an exam, each having responses a, b, c, or d. Each question is worth 5 points, and only one option per question is correct. Suppose the student guesses the answer to each question, and his or her guesses from question to question are independent. The student's mean number of questions correct on the exam should be

- A. 1.25.
  - B. 2.5.
  - C. 6.25.
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4. As part of a promotion for a new type of cracker, free trial samples are offered to shoppers in a local supermarket. The probability that a shopper will buy a packet of crackers after tasting the free sample is 0.200. Different shoppers can be regarded as independent trials. Let  $X$  be the number among the next twenty shoppers who buy a packet of the crackers after tasting a free sample. The standard deviation of  $X$  is

- A. 4.00.
  - B. 3.20.
  - C. 1.79.
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5. As part of a promotion for a new type of cracker, free trial samples are offered to shoppers in a local supermarket. The probability that a shopper will buy a packet of crackers after tasting the free sample is 0.200. Different shoppers can be regarded as independent trials. If  $X$  is the number among the next 100 shoppers who buy a packet of crackers after tasting a free sample, then  $X$  has approximately a

- A.  $N(20, 16)$  distribution.
- B.  $N(20, 4)$  distribution.
- C.  $N(0.2, 16)$  distribution.

6. As part of a promotion for a new type of cracker, free trial samples are offered to shoppers in a local supermarket. The probability that a shopper will buy a packet of crackers after tasting the free sample is 0.200. Different shoppers can be regarded as independent trials. If  $X$  is the number among the next 100 shoppers who buy a packet of the crackers after tasting a free sample, then the probability that fewer than 30 buy a packet after tasting a free sample is approximately

- A. 0.2000.
  - B. 0.9938.
  - C. None of the above.
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7. Which of the following would have a binomial distribution?

- A. A couple will have children until they have three girls or five children.  $X$  is the number of children in the family.
  - B. Max the magician (who practices flipping coins) will call flips of a coin in the air.  $X$  is the number of correct calls in 10 flips.
  - C. None of the others is binomial.
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8. The binomial coefficient, written  $\binom{n}{k}$ , gives what information?

- A. The probability of obtaining  $k$  successes in  $n$  trials.
  - B. The number of ways in which one can obtain  $k$  successes in  $n$  trials.
  - C. The chance of observing a success.
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9. From previous polls, it is believed that 66% of likely voters prefer the incumbent. A new poll of 500 likely voters will be conducted. In the new poll, if the proportion favoring the incumbent has not changed, what is the mean and standard deviation of the number preferring the incumbent?

- A.  $\mu = 330$ ,  $\sigma = 10.59$
  - B.  $\mu = 0.66$ ,  $\sigma = 10.59$
  - C.  $\mu = 330$ ,  $\sigma = 18.17$
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10. A salesman makes visits to customers. Based on his past history, the probability he makes a sale on any visit is 0.15. It is reasonable to assume that customers' decisions are independent of one another. If he makes 10 visits in a day, what is the chance he makes at least 5 sales?

- A. 0.15
- B. 0.9986
- C. 0.0099