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Course: Math 101 -Summer 2016-Sec. 953 (Choden)

Assignment: HW 8: Probability Day 3 (Lecture 8)

1. Determine whether the two given events are independent.

   A fair coin is tossed twice. The events are "head on the first" and "tails on the second."

   The two events are (1) ____________

   (1) ○ not independent.
   ○ independent.

2. The table shows the result of a restaurant survey.

Meals	Service good	Service poor	Total
Lunch	38	48	86
Dinner	24	19	43
Total	62	67	129

   Find the probability the service was good, given that the meal was dinner.

   The probability the service was good, given that the meal was dinner, is ____________.
   (Type an integer or a simplified fraction.)

3. A pet store has 12 puppies, including 5 poodles, 5 terriers, and 2 retrievers. If Rebecka and Aaron, in that order, each select one puppy at random with replacement (they may both select the same one), find the probability that they both select a poodle.

   The probability is ____________.
   (Type an integer or a simplified fraction.)

4. A pet store has 14 puppies, including 4 poodles, 5 terriers, and 5 retrievers. If Rebecka and Aaron, in that order, each select one puppy at random with replacement (they may both select the same one), find the probability that Rebecka selects a terrier and Aaron selects a retriever.

   The probability is ____________.
   (Type an integer or a fraction.)

5. A pet store has 13 puppies, including 3 poodles, 5 terriers, and 5 retrievers. If Rebecka and Aaron, in that order, each select one puppy at random without replacement, find the probability that both select a poodle.

   The probability is ____________.
   (Type an integer or a simplified fraction.)

6. A pet store has 10 puppies, including 3 poodles, 6 terriers, and 1 retriever. Rebecka and Aaron, in that order, each select one puppy at random without replacement. Find the probability that Aaron selects a retriever, given Rebecka selects a retriever.

   The probability is ____________.
   (Type an integer or a simplified fraction.)

7. Elizabeth brought a box of donuts to share. There are two-dozen (24) donuts in the box, all identical in size, shape, and color. Three are jelly-filled, 6 are lemon-filled, and 15 are custard-filled. You randomly select one donut, eat it, and select another donut. Find the probability of selecting a lemon-filled donut followed by a jelly-filled donut.

__________ (Type an integer or a simplified fraction.)

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8. Given two events A and B within the sample space S,

$$P(A|B) = \frac{n(A \text{ and } B)}{n(B)}.$$

Use this result to find the probability P(spade|black) when a single card is drawn from a standard 52-card deck.

P(spade|black) = __________
(Type an integer or a fraction.)

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9. Given events A and B within the sample space S, the following formula can be used to compute conditional probabilities.

$$P(B|A) = \frac{n(A \text{ and } B)}{n(A)}$$

Use this result to find the probability P(heart | red) when a single card is drawn from a standard 52-card deck.

P(heart | red) = __________ (Simplify your answer.)

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10. Suppose a coin is biased so that it has the probabilities below for landing on heads (h) or tails (t) on a single toss of the coin.

$P(h) = 0.5440$ and $P(t) = 0.4560$

If this coin is tossed twice, find the probability P(hh).

P(hh) = __________
(Type an integer or decimal rounded to four decimal places as needed.)

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11. Explain in words what is meant by "expected value of a random variable."

Choose the best answer below.

- **A.** Given a random variable and it's probability, the expected value is the product of the value of the variable and the probability.
- **B.** Given a random variable with different values, each with their own probability, the expected value of the random variable is like a weighted average of the values and their respective probabilities.
- **C.** Given a random variable with different values, the average of these values is the expected value of the random variable.
- **D.** Given a random variable, it's expected value is the probability of the occurence of the variable.

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12. You are playing a game in which you flip 3 fair coins. It costs $3 to play the game, which must be subtracted from your winnings. Calculate the expected net winnings for the game. If all coins show the same (all heads or all tails), you win $10, otherwise, you lose your $3.

The expected net winnings of the game are $__________.

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13. A used-car dealer gets complaints about his cars as shown in the table.

Number of complaints per day	0	1	2	3	4	5	6
Probability	0.01	0.06	0.16	0.22	0.35	0.11	0.09

Find the expected number of complaints per day.

The expected number of complaints per day is ____________.
(Do not round your answer.)

14. Twenty thousand raffle tickets are sold. One first prize of $3000, two second prizes of $500, and three third prizes of $200 each will be awarded, with all winners selected randomly. If you purchased one ticket, what are your expected gross winnings?

The expected gross winnings are ____________ cents.
(Round your answer to the nearest whole cent.)

15. In a certain city, projections for the next year indicate there is a 20% chance that electronics jobs will increase by 1300, a 50% chance that they will increase by 500, and a 30% chance they will decrease by 700. Find the expected change in the number of electronics jobs in that city in the next year.

The expected change is an increase of ____________ jobs.