1. Among 450 randomly selected drivers in the 20 – 24 age bracket, 9 were in a car crash in the last year. If a driver in that age bracket is randomly selected, what is the approximate probability that he or she will be in a car crash during the next year? Is it unusual for a driver in that age bracket to be involved in a car crash during a year? Is the resulting value high enough to be of concern to those in the 20 – 24 age bracket? Consider an event to be "unusual" if its probability is less than or equal to 0.05.

The probability that a randomly selected person in the 20 – 24 age bracket will be in a car crash this year is approximately \( \square \).

(Type an integer or decimal rounded to the nearest thousandth as needed.)

Would it be unusual for a driver in that age bracket to be involved in a car crash this year?

- No
- Yes

Is the probability high enough to be of concern to those in the 20 – 24 age bracket?

- No
- Yes

Answers 0.020

the second choice

the first choice

2. A research center poll showed that 75% of people believe that it is morally wrong to not report all income on tax returns. What is the probability that someone does not have this belief?

The probability that someone does not believe that it is morally wrong to not report all income on tax returns is \( \square \).

(Type an integer or a decimal.)

Answer: 0.25
3. Use the following results from a test for marijuana use, which is provided by a certain drug testing company. Among 144 subjects with positive test results, there are 23 false positive results. Among 153 negative results, there are 5 false negative results. Complete parts (a) through (c). (Hint: Construct a table.)

a. How many subjects were included in the study?

The total number of subjects in the study was \( \square \).

b. How many subjects did not use marijuana?

A total of \( \square \) subjects did not use marijuana.

c. What is the probability that a randomly selected subject did not use marijuana?

The probability that a randomly selected subject did not use marijuana is \( \square \).
(Do not round until the final answer. Then round to three decimal places as needed.)

Answers

\[
\begin{align*}
297 \\
171 \\
0.576
\end{align*}
\]
4. The principle of redundancy is used when system reliability is improved through redundant or backup components. Assume that your alarm clock has a 0.853 probability of working on any given morning and answer the questions below.

a. What is the probability that your alarm clock will not work on the morning of an important final exam?

☐ (Type an exact answer in simplified form.)

b. If you have two such alarm clocks, what is the probability that they both fail on the morning of an important final exam?

☐ (Type an exact answer in simplified form.)

c. With one alarm clock, you have a 0.853 probability of being awakened. What is the probability of being awakened if you use two alarm clocks?

☐ (Type an exact answer in simplified form.)

d. Does a second alarm clock result in greatly improved reliability?

☐ A. Yes, total malfunction would not be impossible, but it would be unusual.

☐ B. No, total malfunction would still not be unusual.

☐ C. No, the malfunction of both is equally or more likely than the malfunction of one.

☐ D. Yes, you can always be certain that at least one alarm clock will work.

Answers
0.147
0.021609
0.978391

A

5. When testing for current in a cable with eleven color-coded wires, the author used a meter to test three wires at a time. How many different tests are required for every possible pairing of three wires?

The number of tests required is ☐.

Answer: 165
6. There is a 0.0831 probability that a best-of-seven contest will last four games, a 0.1675 probability that it will last five games, a 0.1874 probability that it will last six games, and a 0.5620 probability that it will last seven games. Verify that this is a probability distribution. Find its mean and standard deviation. Is it unusual for a team to "sweep" by winning in four games?

What is the mean of the probability distribution?

\[ \mu = \Box \]

(Round to two decimal places as needed.)

What is the standard deviation of the probability distribution?

\[ \sigma = \Box \]

(Round to two decimal places as needed.)

Is it unusual for a team to win in four games? Choose the correct answer below.

\( \bigcirc \) A. No, because the probability that a team wins in four games is less than or equal to 0.05.

\( \bigcirc \) B. No, because the probability that a team wins in four games is greater than 0.05.

\( \bigcirc \) C. Yes, because the probability that a team wins in four games is less than or equal to 0.05.

\( \bigcirc \) D. Yes, because the probability that a team wins in four games is greater than 0.05.

Answers 6.23

1.00

B
7. In a state's Pick 3 lottery game, you pay $1.47 to select a sequence of three digits, such as 877. If you select the same sequence of three digits that are drawn, you win and collect $349.59. Complete parts (a) through (e).

a. How many different selections are possible?

b. What is the probability of winning?

☐ (Type an integer or a decimal.)

c. If you win, what is your net profit?

$☐ (Type an integer or a decimal.)

d. Find the expected value.

$☐ (Round to the nearest hundredth as needed.)

e. If you bet $1.47 in a certain state's Pick 4 game, the expected value is $-1.12. Which bet is better, a $1.47 bet in the Pick 3 game or a $1.47 bet in the Pick 4 game? Explain.

☐ A. The Pick 3 game is a better bet because it has a larger expected value.

☐ B. The Pick 4 game is a better bet because it has a larger expected value.

☐ C. Neither bet is better because both games have the same expected value.

Answers

1,000

0.001

348.12

- 1.12

C
8. Assume that a procedure yields a binomial distribution with a trial repeated \( n \) times. Use a binomial probabilities table to find the probability of \( x \) successes given the probability \( p \) of success on a given trial.

\[ n = 9, \; x = 1, \; p = 0.60 \]

\[ P(1) = \] (Round to three decimal places as needed.)

Answer: 0.004

9. Twelve peas are generated from parents having the green/yellow pair of genes, so there is a 0.75 probability that an individual pea will have a green pod. Find the probability that among the 12 offspring peas, at least 11 have green pods. Is it unusual to get at least 11 peas with green pods when 12 offspring peas are generated? Why or why not?

The probability that at least 11 of the 12 offspring peas have green pods is \( \Box \).
(Round to three decimal places as needed.)

Is it unusual to randomly select 12 peas and find that at least 11 of them have a green pod? Note that a small probability is one that is less than 0.05.

\( \Box A. \) Yes, because the probability of this occurring is not small.
\( \Box B. \) Yes, because the probability of this occurring is very small.
\( \Box C. \) No, because the probability of this occurring is not small.
\( \Box D. \) No, because the probability of this occurring is very small.

Answers 0.159

C
10. A candy company claims that 22% of its plain candies are orange, and a sample of 200 such candies is randomly selected.

a. Find the mean and standard deviation for the number of orange candies in such groups of 200.

\[ \mu = \square \]

\[ \sigma = \square \] (Round to one decimal place as needed.)

b. A random sample of 200 candies contains 31 orange candies. Is this result unusual? Does it seem that the claimed rate of 22% is wrong?

\( \Box A. \) Yes, because 31 is within the range of usual values. Thus, the claimed rate of 22% is probably wrong.

\( \Box B. \) No, because 31 is within the range of usual values. Thus, the claimed rate of 22% is not necessarily wrong.

\( \Box C. \) Yes, because 31 is greater than the maximum usual value. Thus, the claimed rate of 22% is probably wrong.

\( \Box D. \) Yes, because 31 is below the minimum usual value. Thus, the claimed rate of 22% is probably wrong.

Answers

44

5.9

D