Essential Statistics 1st Edition Test Bank Navidi Monk
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Chapter 4 Test bank (Answer keys on last page)
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.
Find P(8).

A) 1/3 B) 2/3 C) 1/12 D) 7/12

2) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.
Find P(Less than 5).

A) 1/3 B) 1/2 C) 1/12 D) 5/12

3) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.
Find P(Greater than 8).

A) 1/3 B) 7/12 C) 1/12 D) 1/4

4) According to a survey, 68% of teenagers could recognize a picture of legendary film star John Wayne. What is the probability that a randomly-selected teenager could recognize John Wayne?

A) 0.32 B) 0.01 C) 0.47 D) 0.68
5) For this year's mayoral election, voter dissatisfaction is very high. In a survey of 500 likely voters, 210 said they planned to write in an independent candidate rather than vote for the Democrat or Republican candidate for mayor.

What is the probability that a surveyed voter plans to write in an independent candidate?
A) 0.58  B) 0.42  C) 0.5  D) 0.21
6) For this year's mayoral election, voter dissatisfaction is very high. In a survey of 800 likely voters, 231 said they planned to write in an independent candidate rather than vote for the Democrat or Republican candidate for mayor.

Estimate the percentage of voters who plan to write in an independent candidate?
A) 71.125%  B) 80%  C) 28.875%  D) 23.1%

7) In a poll of 451 university students, 193 said that they were opposed to legalizing marijuana. What is the probability that a surveyed student opposes legalization of marijuana?
A) 0.572  B) 0.252  C) 0.428  D) 0.748

8) In a poll of 724 university students, 311 said that they were opposed to legalizing marijuana. Estimate the percentage of students who oppose legalizing marijuana.
A) 43%  B) 75.3%  C) 24.7%  D) 57%

9) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). List all the outcomes of the sample space.
A) {AA, AB, AC, BA, BB, BC, CA, CB, CC}
B) {AA, AB, AC, BB, BC, CC}
C) {AB, AC, BA, BC, CA, CB}
D) {A, B, C}

10) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that both answers are "C". [Hint: List all the outcomes of the sample space first.]
A) 1/9  B) 1/3  C) 1/27  D) 1/6

11) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that both answers are the same ("AA", "BB" or "CC"). [Hint: List all the outcomes of the sample space first.]
A) 1/3  B) 1/27  C) 1/6  D) 1/9

12) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that at least one answer is "A". [Hint: List all the outcomes of the sample space first.]
A) 7/9  B) 2/3  C) 1/3  D) 5/9
13) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that the second answer is either "B" or "C". [Hint: List all the outcomes of the sample space first.]
   A) 5/9   B) 7/9   C) 1/3   D) 2/3

14) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that neither of the answers is "B". [Hint: List all the outcomes of the sample space first.]
   A) 2/3   B) 4/9   C) 1/3   D) 5/9

15) A coin is tossed 475 times and comes up heads 242 times. Use the Empirical Method to approximate the probability that the coin comes up heads.
   A) 0.509   B) 0.491   C) 0.5   D) 0.338

16) The arrow on the spinner shown below can be spun so that the arrowhead eventually stops in one of the three sectors labeled "A", "B", or "C". The spinner is spun 166 times and comes up "A" 96 times. Use the Empirical Rule to approximate the probability that the spinner comes up "A".

A) 0.422   B) 0.366   C) 0.5   D) 0.578

17) So far this season, the university's football team has executed 149 running plays, 157 passing plays, and 20 "trick" plays. What is the probability that the team will execute a passing play?
   A) 0.518   B) 0.513   C) 0.457   D) 0.482

18) So far this season, the university's football team has executed 163 running plays, 138 passing plays, and 24 "trick" plays. What is the probability that the team will not execute a trick play?
   A) 0.074   B) 0.926   C) 0.08   D) 0.92
19) A Karate club consists of 35 persons holding a black belt (highest rating), 64 persons holding a brown belt (middle rating), and 97 persons holding a purple belt (lowest rating). What is the probability that a randomly-selected club member holds a black belt?
   A) 0.821  B) 0.179  C) 0.783  D) 0.217

20) A Karate club consists of 46 persons holding a black belt (highest rating), 52 persons holding a brown belt (middle rating), and 95 persons holding a purple belt (lowest rating). What is the probability that a randomly-selected club member holds a brown belt or a purple belt?
   A) 0.313  B) 0.687  C) 0.238  D) 0.762

21) A survey asked respondents to indicate their level of satisfaction with government spending. The results are show below.

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>694</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>4015</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>5671</td>
</tr>
<tr>
<td>Total</td>
<td>10,380</td>
</tr>
</tbody>
</table>

What is the probability that a sampled person was only somewhat satisfied or dissatisfied with government's spending?
   A) 0.933  B) 0.072  C) 0.928  D) 0.067

22) A survey asked respondents to indicate their level of satisfaction with government spending. The results are show below.

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>608</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>3376</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>6194</td>
</tr>
<tr>
<td>Total</td>
<td>10,178</td>
</tr>
</tbody>
</table>

Assume this is a simple random sample from a population. Use the Empirical Method to estimate the probability that a person is dissatisfied with government's spending?
   A) 0.33  B) 0.391  C) 0.647  D) 0.609
23) A survey asked 33,703 homeowners how many pets they owned. The results were as
followed:

<table>
<thead>
<tr>
<th>Number of Pets</th>
<th>Number of Homeowners</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6705</td>
</tr>
<tr>
<td>1</td>
<td>10,544</td>
</tr>
<tr>
<td>2</td>
<td>9049</td>
</tr>
<tr>
<td>3</td>
<td>6463</td>
</tr>
<tr>
<td>4 or more</td>
<td>942</td>
</tr>
<tr>
<td>Total</td>
<td>33,703</td>
</tr>
</tbody>
</table>

What is the probability that a sampled homeowner has three pets?
A) 0.22      B) 0.192    C) 0.78    D) 0.028

24) A survey asked 33,083 homeowners how many pets they owned. The results were as
followed:

<table>
<thead>
<tr>
<th>Number of Pets</th>
<th>Number of Homeowners</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5476</td>
</tr>
<tr>
<td>1</td>
<td>11,229</td>
</tr>
<tr>
<td>2</td>
<td>10,546</td>
</tr>
<tr>
<td>3</td>
<td>5147</td>
</tr>
<tr>
<td>4 or more</td>
<td>685</td>
</tr>
<tr>
<td>Total</td>
<td>33,083</td>
</tr>
</tbody>
</table>

What is the probability that a sampled homeowner has more than 1 pet?
A) 0.176      B) 0.505    C) 0.166    D) 0.495

25) A survey asked 33,347 homeowners how many pets they owned. The results were as
followed:

<table>
<thead>
<tr>
<th>Number of Pets</th>
<th>Number of Homeowners</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5440</td>
</tr>
<tr>
<td>1</td>
<td>10,506</td>
</tr>
<tr>
<td>2</td>
<td>10,193</td>
</tr>
<tr>
<td>3</td>
<td>5751</td>
</tr>
<tr>
<td>4 or more</td>
<td>1457</td>
</tr>
<tr>
<td>Total</td>
<td>33,347</td>
</tr>
</tbody>
</table>

Assume this is a simple random sample of homeowners. Use the Empirical Method to
estimate the probability that a homeowner has at least one pet.
A) 0.805      B) 0.163    C) 0.837    D) 0.195
26) There are 27,307 undergraduate students enrolled at a certain university. The age distribution is as follows:

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 - 14</td>
<td>3</td>
</tr>
<tr>
<td>15 - 17</td>
<td>34</td>
</tr>
<tr>
<td>18 - 22</td>
<td>11,450</td>
</tr>
<tr>
<td>23 - 30</td>
<td>9488</td>
</tr>
<tr>
<td>31 and up</td>
<td>6332</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27,307</strong></td>
</tr>
</tbody>
</table>

What is the probability that a student is between 23 and 30 years old?
A) 0.347  B) 0.232  C) 0.421  D) 0.579

27) There are 29,735 undergraduate students enrolled at a certain university. The age distribution is as follows:

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 - 14</td>
<td>5</td>
</tr>
<tr>
<td>15 - 17</td>
<td>280</td>
</tr>
<tr>
<td>18 - 22</td>
<td>12,050</td>
</tr>
<tr>
<td>23 - 30</td>
<td>10,931</td>
</tr>
<tr>
<td>31 and up</td>
<td>6469</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29,735</strong></td>
</tr>
</tbody>
</table>

What is the probability that a student is less than 18 years old?
A) 0.00017  B) 0.0096  C) 0.0094  D) 0.218

28) If \( P(A) = 0.76 \), \( P(B) = 0.4 \), and \( P(A \text{ and } B) = 0.27 \), find \( P(A \text{ or } B) \).
A) 0.58  B) 0.27  C) 0.135  D) 0.89

29) If \( P(A) = 0.33 \), \( P(B) = 0.51 \), and \( A \) and \( B \) are mutually exclusive, find \( P(A \text{ or } B) \).
A) 0.42  B) 0  C) 0.18  D) 0.84

30) If \( P(A) = 0.4 \), \( P(B) = 0.36 \), and \( P(A \text{ or } B) = 0.76 \), are \( A \) and \( B \) mutually exclusive?
A) No  B) Yes

31) If \( P(A) = 0.46 \), \( P(B) = 0.37 \), and \( P(A \text{ or } B) = 0.61 \), are \( A \) and \( B \) mutually exclusive?
A) No  B) Yes
32) If \( P(A) = 0.79 \), find \( P(A^C) \).
   A) 0.21  
   B) 0.395  
   C) 0.105  
   D) 0.79  

33) If \( P(A^C) = 0.61 \), find \( P(A) \).
   A) 0.195  
   B) 0.39  
   C) 0.61  
   D) 0.305  

34) What is the correct relationship between events \( A \) and \( B \):
   A: Karl is college graduate.
   B: Karl is a high school graduate.
   A) \( A \) and \( B \) are mutually exclusive.
   B) \( B \) is the complement of \( A \).
   C) \( A \) and \( B \) are not mutually exclusive.
   D) If \( B \) is not true, \( A \) cannot be true.

35) What is the correct relationship between events \( A \) and \( B \):
   A: Laura participated in an out-of-town volleyball game at 11:00 AM last Friday.
   B: Laura met with her academic advisor on campus at 11:00 AM last Friday.
   A) \( A \) and \( B \) are mutually exclusive.
   B) \( A \) and \( B \) are complementary.
   C) \( A \) and \( B \) are not mutually exclusive.
   D) If \( B \) is true, \( A \) is true.

36) What is the correct relationship between events \( A \) and \( B \):
   A: Kathleen made an A on her Biology final exam.
   B: Kathleen did not make an A on the Biology final exam.
   A) \( A \) and \( B \) are mutually exclusive.
   B) \( A \) and \( B \) are complementary.
   C) \( A \) and \( B \) are not mutually exclusive.
   D) If \( B \) is untrue, \( A \) is untrue.

37) For the event described below, which of the following represents the complement of the event.
   A sample of 471 software DVDs was selected. Exactly 34 of these were defective.
   A) No more than 34 DVDs were defective.
   B) Exactly 437 DVDs were not defective.
   C) Exactly 34 DVDs were not defective.
   D) The number of defective DVDs was not equal to 34.

38) For the event described below, which of the following represents the complement of the event.
   A sample of 301 software DVDs was selected. At least 34 of these were defective.
   A) Exactly 34 DVDs were not defective.
   B) Fewer than 34 DVDs were defective.
   C) At most 267 DVDs were not defective.
   D) At most 34 DVDs were defective.
39) For the event described below, which of the following represents the complement of the event.

A sample of 372 software DVDs was selected. Fewer than 41 of these were defective.

A) Fewer than 41 DVDs were not defective.
B) At most 41 DVDs were not defective.
C) More than 41 DVDs were not defective.
D) At least 41 DVDs were defective.

40) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

List the outcomes of the sample space.

A) \{LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU\}
B) \{LLL, UUU\}
C) \{LLU, LUL, ULL, UUL, LUU\}
D) None of these.

41) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

Let \(A\) be the event that all three doors are in the same condition. List the outcomes of \(A\).

[Let "L" designate "locked" and U" designate "unlocked"]:]

A) \{LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU\}
B) \{LLL\}
C) \{LLL, UUU\}
D) None of these.

42) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

Let \(B\) be the event that exactly two doors are in the same condition. List the outcomes of \(B\).

[Let "L" designate "locked" and U" designate "unlocked"]:]

A) \{LLU, LUL, ULL, LUU, ULU, UUL\}
B) \{LLU, LUL, ULL\}
C) \{LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU\}
D) None of these.
43) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

Let $B$ be the event that exactly two doors are locked. List the outcomes of $B$. [Let "L" designate "locked" and U" designate "unlocked"].

A) \{LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU\}
B) \{LLU, LUL, ULL\}
C) \{LLU, LUL, LUU, ULL, UUL\}
D) None of these.

44) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

Let $C$ be the event that at least two doors are in the same condition. List the outcomes of $C$. [Let "L" designate "locked" and U" designate "unlocked"].

A) \{LLL, UUU, LLU, LUL, ULL\}
B) \{LLU, LUL, ULL, LUU, ULL, UUL, UUU\}
C) \{LLL, LLU, LUL, LUU, ULL, UUL, UUL, UUU\}
D) None of these.

45) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked.

Let $C$ be the event that at least two doors are unlocked. List the outcomes of $C$. [Let "L" designate "locked" and U" designate "unlocked"].

A) \{LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU\}
B) \{LLU, LUL, ULL, LUU, ULL, UUL, UUU\}
C) \{UUU, LUU, ULU, UUL\}
D) None of these.

46) Let $E$ be the event that a corn crop has an infestation of ear worms, and let $B$ be the event that a corn crop has an infestation of corn borers.

Suppose that $P(E) = 0.18$, $P(B) = 0.18$, and $P(E \text{ and } B) = 0.12$. Find the probability that a corn crop has either an ear worm infestation, a corn borer infestation, or both.

A) 0.64  
B) 0.12  
C) 0.48  
D) 0.24

47) Let $E$ be the event that a corn crop has an infestation of ear worms, and let $B$ be the event that a corn crop has an infestation of corn borers.

Suppose that $P(E) = 0.23$, $P(B) = 0.11$, and $P(E \text{ and } B) = 0.05$. Find the probability that a corn crop has no corn borer infestation.

A) 0.89  
B) 0.77  
C) 0.29  
D) 0.66
48) Out of 829 items checked out of a public library, 282 were fiction books, 294 were non-fiction books, and 253 were videos (of any genre). What is the probability that a randomly-selected item was not a video?

A) 0.305  B) 0.340  C) 0.695  D) 0.439

49) On a recent Saturday, a total of 1100 people visited a local library. Of these people, 260 were under age 10, 496 were aged 10–18, 180 were aged 19–30, and the rest were more than 30 years old.

One person is sampled at random. What is the probability that the person is less than 19 years old?

A) 0.451  B) 0.236  C) 0.756  D) 0.687

50) On a recent Saturday, a total of 1062 people visited a local library. Of these people, 233 were under age 10, 493 were aged 10–18, 168 were aged 19–30, and the rest were more than 30 years old.

One person is sampled at random. What is the probability that the person is more than 30 years old?

A) 0.316  B) 0.158  C) 0.726  D) 0.684

51) In a recent semester at a local university, 520 students enrolled in both General Chemistry and Calculus I. Of these students, 88 received an A in general chemistry, 76 received an A in calculus, and 31 received an A in both general chemistry and calculus.

Find the probability that a randomly chosen student received an A in general chemistry or calculus or both.

A) 0.315  B) 0.256  C) 0.375  D) 0.811

52) In a recent semester at a local university, 540 students enrolled in both General Chemistry and Calculus I. Of these students, 72 received an A in general chemistry, 65 received an A in calculus, and 31 received an A in both general chemistry and calculus.

Find the probability that a randomly chosen student did not receive an A in general chemistry.

A) 0.867  B) 0.809  C) 0.88  D) 0.133
53) On a certain day, a cheese packaging facility packaged 500 units of mozzarella cheese. Some of these packages had major flaws, some had minor flaws, and some had both major and minor flaws. The following table presents the results.

<table>
<thead>
<tr>
<th></th>
<th>Minor Flaw</th>
<th>No Minor Flaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Flaw</td>
<td>24</td>
<td>38</td>
</tr>
<tr>
<td>No Major Flaw</td>
<td>51</td>
<td>387</td>
</tr>
</tbody>
</table>

Find the probability that a randomly chosen cheese package has a major flaw.

A) 0.076  
B) 0.048  
C) 0.124  
D) 0.16

54) On a certain day, a cheese packaging facility packaged 560 units of mozzarella cheese. Some of these packages had major flaws, some had minor flaws, and some had both major and minor flaws. The following table presents the results.

<table>
<thead>
<tr>
<th></th>
<th>Minor Flaw</th>
<th>No Minor Flaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Flaw</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td>No Major Flaw</td>
<td>59</td>
<td>448</td>
</tr>
</tbody>
</table>

Find the probability that a randomly chosen cheese package has a minor flaw.

A) 0.172  
B) 0.138  
C) 0.105  
D) 0.095

55) On a certain day, a cheese packaging facility packaged 480 units of mozzarella cheese. Some of these packages had major flaws, some had minor flaws, and some had both major and minor flaws. The following table presents the results.

<table>
<thead>
<tr>
<th></th>
<th>Minor Flaw</th>
<th>No Minor Flaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Flaw</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>No Major Flaw</td>
<td>60</td>
<td>374</td>
</tr>
</tbody>
</table>

Find the probability that a randomly chosen cheese package has a flaw (major or minor).

A) 0.254  
B) 0.188  
C) 0.779  
D) 0.221
56) On a certain day, a cheese packaging facility packaged 480 units of mozzarella cheese. Some of these packages had major flaws, some had minor flaws, and some had both major and minor flaws. The following table presents the results.

<table>
<thead>
<tr>
<th></th>
<th>Minor Flaw</th>
<th>No Minor Flaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Flaw</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>No Major Flaw</td>
<td>51</td>
<td>376</td>
</tr>
</tbody>
</table>

Find the probability that randomly chosen cheese package has no major flaw.
A) 0.783  B) 0.835  C) 0.89  D) 0.217

57) A poll was taken of 14,972 working adults aged 40-70 to determine their level of education. The participants were classified by sex and by level of education. The results were as follows.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School or Less</td>
<td>3820</td>
<td>2803</td>
<td>6623</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>3425</td>
<td>3847</td>
<td>7272</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>508</td>
<td>442</td>
<td>950</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>73</td>
<td>54</td>
<td>127</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7826</td>
<td>7146</td>
<td>14,972</td>
</tr>
</tbody>
</table>

A person is selected at random. Compute the probability that the person is female and has a bachelor's degree.
A) 0.963  B) 0.229  C) 0.538  D) 0.257

58) A poll was taken of 14,292 working adults aged 40-70 to determine their level of education. The participants were classified by sex and by level of education. The results were as follows.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School or Less</td>
<td>3594</td>
<td>2729</td>
<td>6323</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>3245</td>
<td>3652</td>
<td>6897</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>566</td>
<td>401</td>
<td>967</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>63</td>
<td>42</td>
<td>105</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7468</td>
<td>6824</td>
<td>14,292</td>
</tr>
</tbody>
</table>

A person is selected at random. Compute the probability that the person is male or has a Ph.D.
A) 0.008  B) 0.523  C) 0.530  D) 0.525
A poll was taken of 14,056 working adults aged 40-70 to determine their level of education. The participants were classified by sex and by level of education. The results were as follows.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School or Less</td>
<td>3141</td>
<td>2434</td>
<td>5575</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>3619</td>
<td>3761</td>
<td>7380</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>534</td>
<td>472</td>
<td>1006</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>52</td>
<td>43</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7346</td>
<td>6710</td>
<td>14,056</td>
</tr>
</tbody>
</table>

A person is selected at random. Compute the probability that the person has a master's degree.

A) 0.034  B) 0.038  C) 0.036  D) 0.072

60) Let \( A \) and \( B \) be events with \( P(A) = 0.7, P(B) = 0.5, \) and \( P(B|A) = 0.4. \) Find \( P(A \text{ and } B). \)

A) 0.35  B) 0.2  C) 0.57  D) 0.28

61) Let \( A \) and \( B \) be events with \( P(A) = 0.8, P(B) = 0.6. \) Assume that \( A \) and \( B \) are independent. Find \( P(A \text{ and } B). \)

A) 0.8  B) 0.6  C) 0.75  D) 0.48

62) Let \( A, B \) and \( C \) be independent events with \( P(A) = 0.6, P(B) = 0.3, \) and \( P(C) = 0.2. \) Find \( P(A \text{ and } B \text{ and } C). \)

A) 0.18  B) 0.9  C) 0.033  D) 0.036

63) A fair coin is tossed four times. What is the probability that the sequence of tosses is HHTT?

A) 0.038  B) 0.25  C) 0.0625  D) 0.125

64) A fair die is rolled two times. What is the probability that both rolls are 3?

A) 0.0046  B) 0.167  C) 0.083  D) 0.028

65) Assume a soldier is selected at random from the Army. Determine whether the events \( A \) and \( B \) are independent, mutually exclusive, or neither.

\( A: \) The soldier is a corporal.
\( B: \) The soldier is a colonel.

A) mutually exclusive  B) neither  C) independent

66) Let \( A \) and \( B \) be events with \( P(A) = 0.2, P(B) = 0.5, \) and \( P(A \text{ and } B) = 0.08. \) Are \( A \) and \( B \) independent?

A) Yes  B) No
67) Let $A$ and $B$ be events with $P(A) = 0.9$, $P(B) = 0.5$, and $P(A \text{ and } B) = 0.45$. Are $A$ and $B$ independent?

A) No  
B) Yes

68) Let $A$ and $B$ be events with $P(A) = 0.4$, $P(B) = 0.9$, and $P(A \text{ and } B) = 0.32$. Are $A$ and $B$ mutually exclusive?

A) Yes  
B) No

69) A fair die is rolled five times. What is the probability that it comes up 5 at least once?

A) 0.5981  
B) 0.8333  
C) 0.1667  
D) 0.5177

70) An unfair coin has a probability 0.4 of landing heads. The coin is tossed two times. What is the probability that it lands heads at least once?

A) 0.64  
B) 0.84  
C) 0.5  
D) 0.6

71) The letters "A", "B", "C", "D", "E", and "F" are written on six slips of paper, and the slips are placed into a hat. If the slips are drawn randomly without replacement, what is the probability that "A" is drawn first and "B" is drawn second?

A) 0.024  
B) 0.033  
C) 0.028  
D) 0.039

72) A fast-food restaurant chain has 623 outlets in the United States. The following table categorizes them by city population and location and presents the number of outlets in each category. An outlet is chosen at random from the 623 to test market a new menu.

<table>
<thead>
<tr>
<th>Population of city</th>
<th>NE</th>
<th>SE</th>
<th>SW</th>
<th>NW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 50,000</td>
<td>30</td>
<td>26</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>50,000 - 500,000</td>
<td>60</td>
<td>48</td>
<td>50</td>
<td>39</td>
</tr>
<tr>
<td>Over 500,000</td>
<td>72</td>
<td>125</td>
<td>79</td>
<td>48</td>
</tr>
</tbody>
</table>

Given that the outlet is located in a city with a population under 50,000, what is the probability that it is in the Southwest?

A) 0.265  
B) 0.164  
C) 0.255  
D) 0.043
73) A fast-food restaurant chain has 617 outlets in the United States. The following table categorizes them by city population and location and presents the number of outlets in each category. An outlet is chosen at random from the 617 to test market a new menu.

<table>
<thead>
<tr>
<th>Population of city</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>Under 50,000</td>
<td>32</td>
</tr>
<tr>
<td>50,000 - 500,000</td>
<td>50</td>
</tr>
<tr>
<td>Over 500,000</td>
<td>76</td>
</tr>
</tbody>
</table>

Given that the outlet is located in the West (either SW or NW), what is the probability that it is in a city with population 50,000–500,000?

A) 0.268  
B) 0.156  
C) 0.716  
D) 0.368

74) A lot of 1000 components contains 150 that are defective. Two components are drawn at random and tested. Let \( A \) be the event that the first component drawn is defective, and let \( B \) be the event that the second component drawn is defective.

Find \( P(A) \).

A) 0.0224  
B) 0.0067  
C) 0.15  
D) 0.1491

75) A lot of 1000 components contains 200 that are defective. Two components are drawn at random and tested. Let \( A \) be the event that the first component drawn is defective, and let \( B \) be the event that the second component drawn is defective.

Find \( P(B|A) \).

A) 0.1992  
B) 0.005  
C) 0.2  
D) 0.0398

76) A lot of 1000 components contains 300 that are defective. Two components are drawn at random and tested. Let \( A \) be the event that the first component drawn is defective, and let \( B \) be the event that the second component drawn is defective.

Find \( P(B \text{ and } A) \).

A) 0.0898  
B) 0.2993  
C) 0.0033  
D) 0.3

77) Evaluate the factorial: 10!

A) 362,880  
B) 3,628,800  
C) 90  
D) 100

78) Evaluate the permutation: \( 10^P4 \)

A) 5040  
B) 210  
C) 40  
D) 3,628,800
79) Evaluate the combination: \(7^C3\)
   A) 5040  
   B) 210  
   C) 21  
   D) 35

80) At the campus cafeteria, a diner can purchase a "meal deal" that consists of an entree, a side dish, and a dessert. There are 3 choices for the entree, 5 choices for the side dish, and 3 choices for dessert. How many different meal deals are possible?
   A) 165  
   B) 11  
   C) 39  
   D) 45

81) On a TV game show, a contestant is shown 9 products from a grocery store and is asked to choose the three least-expensive items in the set. The three chosen items need not be in any particular order. In how many ways can the contestant choose the three items?
   A) 84  
   B) 60,480  
   C) 504  
   D) 6

82) On a TV game show, a contestant is shown 10 products from a grocery store and is asked to choose the three least-expensive items in the set, and then correctly arrange these three items in order of price. In how many ways can the contestant choose the three items?
   A) 6  
   B) 604,800  
   C) 720  
   D) 120

83) The numbers 1 through 10 are written in separate slips of paper, and the slips are placed into a box. Then, 4 of these slips are drawn at random.

   What is the probability that the drawn slips are "1", "2", "3", and "4", in that order?
   A) 0.11424  
   B) 0.000198  
   C) 0.004752  
   D) 0.00476

84) A committee consist of 10 women and 7 men. Three members are chosen as officers. What is the probability that all three officers are women?
   A) 0.03392  
   B) 0.0515  
   C) 0.1765  
   D) 0.2035
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
Answer Key
Testname: UNTITLED4

51) B
52) A
53) C
54) B
55) D
56) C
57) D
58) D
59) D
60) D
61) D
62) D
63) C
64) D
65) A
66) B
67) B
68) B
69) A
70) A
71) B
72) A
73) D
74) C
75) A
76) A
77) B
78) A
79) D
80) D
81) A
82) C
83) B
84) C

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