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) \(\frac{1}{12}\)  B) \(\frac{7}{12}\)  C) \(\frac{1}{3}\)  D) \(\frac{2}{3}\)

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 \(P(\text{Less than 5})\).

A) \(\frac{1}{12}\)  B) \(\frac{1}{2}\)  C) \(\frac{1}{3}\)  D) \(\frac{5}{12}\)

3) 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) 0.68  C) 0.01  D) 0.47

4) 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) 0.21  B) 0.5  C) 0.42  D) 0.58

5) 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
6) 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) \{AB, AC, BA, BC, CA, CB\}
   B) \{A, B, C\}
   C) \{AA, AB, AC, BB, BC, CC\}
   D) \{AA, AB, AC, BA, BB, BC, CA, CB, CC\}

7) 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) \frac{1}{9}
   B) \frac{1}{3}
   C) \frac{1}{6}
   D) \frac{1}{27}

8) 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) \frac{7}{9}
   B) \frac{1}{3}
   C) \frac{2}{3}
   D) \frac{5}{9}

9) 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>9,488</td>
</tr>
<tr>
<td>31 and up</td>
<td>6,332</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) 0.579
   B) 0.347
   C) 0.421
   D) 0.232

10) 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) 0.457
   B) 0.513
   C) 0.482
   D) 0.518

11) 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
12) 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) 0.77  
B) 0.29  
C) 0.66  
D) 0.89

13) 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) 0.48  
B) 0.12  
C) 0.64  
D) 0.24

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

15) 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) At most 267 DVDs were not defective.
C) At most 34 DVDs were defective.
D) Fewer than 34 DVDs were defective.

16) 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.
17) 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) 0.88  B) 0.809  C) 0.867  D) 0.133

18) 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) 0.684  B) 0.316  C) 0.726  D) 0.158

19) 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.

20) If \( P(A^C) = 0.61 \), find \( P(A) \).

A) 0.39  B) 0.195  C) 0.305  D) 0.61

21) If \( P(A) = 0.79 \), find \( P(A^C) \).

A) 0.21  B) 0.105  C) 0.395  D) 0.79

22) 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) 0.84  C) 0.18  D) 0
Answer Key
Testname: SECTION 4.1 AND 4.2 INCLASS EXERCISES

1) A
2) C
3) B
4) C
5) C
6) D
7) B
8) D
9) B
10) C
11) B
12) D
13) D
14) D
15) D
16) B
17) C
18) D
19) A
20) A
21) A
22) B