Mathematics 1050
Quiz 5 with solutions.

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Name:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>Total</th>
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<tbody>
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I. (5pts.) A single ball is taken at random from an urn containing 10 balls numbered 1 through 10. What is the probability of obtaining the following:

1. An even-numbered ball.
2. A ball different from 5.

\[
S = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \}
\]

\[
E = \{ 2, 4, 6, 8, 10 \}
\]

\[
P(E) = \frac{n(E)}{n(S)} = \frac{5}{10} = \frac{1}{2}
\]

\[
F = \{ 5 \}
\]

\[
P(F^c) = 1 - P(F) = 1 - \frac{1}{10} = \frac{9}{10}.
\]
II. (5 pts.) The following table shows the probability that there is a given number waiting in line at a checkout register at Dear's Department store.

<table>
<thead>
<tr>
<th>Number of persons in Line</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.10</td>
</tr>
<tr>
<td>1</td>
<td>0.15</td>
</tr>
<tr>
<td>2</td>
<td>0.20</td>
</tr>
<tr>
<td>3</td>
<td>0.35</td>
</tr>
<tr>
<td>4 or more</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Find the probability of having:

1. Exactly 2 persons in line.
2. More than 3 persons or fewer than 2 persons in line.

\[
\text{Solution: } P(2) = 0.20. \quad (2)
\]

\[
P(x > 3 \text{ or } x < 2) = P(x = 4) + P(x = 0) + P(x = 1) = 0.20 + 0.10 + 0.15 = 0.45. \quad (3)
\]