(1) Three couples that were invited to dinner will independently show up with probabilities 0.9, 0.8, and 0.75. Let $N$ be the number of couples that show up. Calculate the probability that $N = 3$ and that of $N = 2$.

(2) Suppose we roll two fair 6-sided dice. Let $X$ be a random variable corresponding to the minimum value of the two rolls. Find the probability mass function $f_X$.

(3) Let $X$ be a discrete random variable on the probability space $(\Omega, \mathcal{F}, \mathbb{P})$, defined by its probability mass function given in the following table:

<table>
<thead>
<tr>
<th>$x$</th>
<th>-4</th>
<th>-1</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_X(x)$</td>
<td>0.15</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Find the following:
(a) $\mathbb{P}(X$ is even) (here we regard 0 as even)
(b) $\mathbb{P}(1 \leq X \leq 8)$
(c) $\mathbb{P}(X = -4 \mid X \leq 0)$
(d) $\mathbb{P}(X \geq 3 \mid X > 0)$

(4) For what value of $c$ the function $p$, defined by

$$p(k) = \begin{cases} 
\frac{c}{k(k+1)} & \text{if } k = 1, 2, \ldots, \\
0 & \text{otherwise},
\end{cases}$$

a probability mass function?