Combinations (F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Shanks 🌞</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Marks:</td>
<td></td>
</tr>
</tbody>
</table>

1. Three friends, Ann (A), Bob (B) and Carol (C), go on holiday together.
   They book a row of three seats on the plane.
   When they arrive at the plane they sit in a random order.
   List all the different orders they could sit on the three seats.
   The first one has been done for you.

<table>
<thead>
<tr>
<th>Seat 1</th>
<th>Seat 2</th>
<th>Seat 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>A</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>B</td>
<td>A</td>
</tr>
</tbody>
</table>

2. A game is played by rolling a fair ordinary dice and throwing a fair coin.
   (a) List all the possible outcomes.

<table>
<thead>
<tr>
<th>Dice</th>
<th>Coin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H</td>
</tr>
<tr>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>2</td>
<td>H</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
</tr>
<tr>
<td>3</td>
<td>H</td>
</tr>
<tr>
<td>3</td>
<td>T</td>
</tr>
<tr>
<td>4</td>
<td>H</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
</tr>
<tr>
<td>5</td>
<td>H</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
</tr>
<tr>
<td>6</td>
<td>H</td>
</tr>
<tr>
<td>6</td>
<td>T</td>
</tr>
</tbody>
</table>
(b) Natalie wins if she gets an even number and a head.

What is the probability she wins?

\[
\frac{3}{12} = \frac{1}{4} \quad [1]
\]

3. Sally has three tiles.

\[
\begin{array}{ccc}
1 & 2 & 3 \\
1 & 3 & 2 \\
2 & 1 & 3 \\
2 & 3 & 1 \\
3 & 1 & 2 \\
3 & 2 & 1 \\
\end{array}
\]

Each tile has a different number on it.

Sally puts the three tiles down to make a number.

Each number is made with all three tiles.

How many different numbers can Sally make?

so 6 different numbers. \quad [2]

4. In a box there are three types of chocolates.

There are 6 plain chocolates,

8 milk chocolates

and 10 white chocolates.

Deon takes 2 chocolates from the box.

(b) Write down all the possible combinations of types of chocolates that Deon can take.

\[
\begin{aligned}
\text{P} &\text{M} &\text{M} &\text{W} &\text{W} \\
\text{P} &\text{P} &\text{M} &\text{M} &\text{W} \\
\text{P} &\text{P} &\text{M} &\text{M} &\text{M} \\
\end{aligned}
\]

\quad [2]

5. Beth uses these four cards to make 4-digit numbers.

\[
\begin{array}{cccc}
2 & 4 & 5 & 8 \\
8 & 2 & 4 & 5 \\
8 & 4 & 2 & 5 \\
8 & 5 & 2 & 4 \\
\end{array}
\]

How many different 4-digit numbers can she make that are greater than 8000?

\[
\begin{aligned}
8 &2 &4 &5 \\
8 &4 &2 &5 \\
8 &5 &2 &4 \\
\end{aligned}
\]

so 6. \quad [2]