In ______, the American architect Alfred Mosher Butts invented the letter tile word game, Scrabble. It took ______ years for the game to be copyright registered, manufactured and sold to the mass market. The date of the copyright is December ______, ______. Today the game is sold in ______ countries and is available in ______ languages.

**Scramble for the Scrabble Dates**

**Use the clues to figure out the mystery numbers.**

A: A 20th century date. The sum of the tens and ones digits is the least two-digit prime number. The ones digit is a power of 2. The tens digit is the least single-digit odd prime number.

B: The least multiple of 2 and 5.

C: A factor of all numbers

D: A 20th century date. The tens digit is half the ones digit. The sum of the digits is 22.

E: $11^2$
Unusual Numbers

EMIRP is PRIME spelled backwards. EMIRP Numbers are prime numbers that are also prime numbers when their digits are reversed. EMIRPs don’t include palindromic numbers like 11 or 151.

Example: 107 is a prime number. 701 is prime.
So 107 is an EMIRP and 701 is an EMIRP

A. What are eight EMIRP numbers less than 100?

[Blank]

B. What are the seven EMIRP Numbers $e$ when $100 < e < 200$?

[Blank]

Catalan Numbers

Named after the Belgian mathematician Eugene Catalan (1814-1894), Catalan Numbers are of the form:

$$\text{Catalan Numbers} = \frac{(2 \times n)!}{(n + 1)!n!}$$

Example: When $n = 1$, then $\frac{(2 \times 1)!}{(1 + 1)!1!} = 1$

When $n = 2$, then $\frac{(2 \times 2)!}{(2 + 1)!2!} = \frac{4!}{3! \times 2!} = \frac{24}{6 \times 2} = 2$

2 is the second Catalan Number

What are the next five numbers in the Catalan sequence?

1, 2, ___, ___, ___, ___
Room to Room
Can you find a path through each house that will take you into each room by passing through each door only once? You may enter a room more than once but not by the same door.

1.

2.

3.
Balzano is a puzzle that will tap into your logical reasoning abilities. Read the directions carefully, then try your hand at Balzano Shapes.

**Directions:**
Your job is to figure out the Desired Arrangement (the solution) of three or more elements (shapes) from clues that provide information about the shapes and their locations. The possible shapes are circle, hexagon, square, and triangle.

The **Arrangement Column** shows sets of shapes in rows. In the Balzano puzzle below, the second row arranged in order from left to right is: triangle, circle, and hexagon.

**Correct Shape in the Correct Place** identifies the number of elements that are the correct shape AND are in the right place. The second row has zero shapes in the right place.

**Correct Shape in the Wrong Place** identifies the number of correct shapes BUT in the wrong place. There are 2 of these in the second row.

**Incorrect Shape** identifies the number of shapes that do not belong in the arrangement. There is 1 of these in the second row.

<table>
<thead>
<tr>
<th>Arrangement</th>
<th>Correct shape in correct place</th>
<th>Correct shape in wrong place</th>
<th>Incorrect shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ □ □</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>△ ○ □</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>○ □ △</td>
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<td>□ △ △</td>
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<tr>
<td>□ ○ ○</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>□ □ □</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>