Reverse Engineering
Input File: reverse.txt

You are a construction worker who is collecting materials. You have been given an image of the latest shipment; however, the categories of materials have been mixed up. Your job is to determine the shape, size, and substance type of the various materials. There are a few key pieces to this problem:

- There are three different shapes that the materials can have: **linear**, **triangular**, and **rectangular**.

- Area is calculated using `width * height` for linear and rectangular figures and `0.5 * width * height` for triangular figures, **not** by counting the enclosed spaces.

- The linear shapes will always have a height of `1`.

- Triangular shapes have heights represented by the number of lines and widths represented by the number of characters on the last line.

- The top and bottom lines of the triangle will contain an odd number of characters (excluding spaces), and will always resemble an isosceles triangle similar to the structure below:

```
   X
  X X
 X   X
XXXXXXX
```

- The rectangular shapes can have equal or different heights and widths.

- The minimum width is `2`, the maximum width `10`, the minimum height is `1`, the maximum height is `10`.

- There are three different types of materials, symbolized by their corresponding symbols:
    - **Wood:** `W`
    - **Metal:** `M`
    - **Clay:** `C`

Input:

The first line contains an integer N. There are N following "materials," each material separated by a new line. The size of the material is symbolized by the width/height of the characters, and the type of material is symbolized by the characters (`W`, `M`, `C`) outlining the shape.

Output:

You will output N lines of descriptions, each line containing the shape, the area, and the substance of the material, in that order. Each piece of data (shape, area, and substance) will be separated by a semicolon and a space. The final area will always be an integer.

Example Input:

```
4
WWWWW
W   W
W   W
WWWWW

    M
  M M
 M   M
MMMMMMM

CCCCCCCCCC

MM
MM
```

Example Output:

```
Rectangular; 20; Wood
Triangular; 14; Metal
Linear; 10; Clay
Rectangular; 4; Metal
```