

## Cryptography Week 1

Draw coded pictures on graph paper starting with a dot on the grid intersection and following the instructions below.

For example:  $\downarrow 1 \searrow 2$  means that one has to draw a line going down one box of the grid, and then continue drawing diagonally down right across two boxes.

1. Sketch the following code:

$\nearrow 1 \rightarrow 1 \downarrow 2 \rightarrow 3 \swarrow 2 \leftarrow 1$   
 $\downarrow 1 \searrow 1 \leftarrow 3 \nearrow 1 \uparrow 1 \leftarrow 1$   
 $\nwarrow 2 \rightarrow 3 \uparrow 1 \leftarrow 1$

2. Sketch the following code:

$\rightarrow 1 \downarrow 1 \leftarrow 3 \searrow 2 \rightarrow 1 \downarrow 1$   
 $\swarrow 1 \rightarrow 3 \nwarrow 1 \uparrow 1 \rightarrow 1 \nearrow 2$   
 $\leftarrow 3 \uparrow 2 \leftarrow 1 \swarrow 1$

3. A wicked witch grabbed Hermione Granger and took her to the witch's cabin. Hermione remembered the path to the cabin but she had no graph paper to draw it:

$\searrow 2 \uparrow 1 \rightarrow 2 \downarrow 2 \leftarrow 4 \uparrow 1$

Now give Hermione the code to return to the school without drawing the path.

4. Examine the beginning of the code for a picture. Find the pattern and add another line of code.

**→1 ↓2 ←3 ↑4**  
**→5 ↓6 ←7 ↑8**  
**→9 ↓10 ←11 ↑12**

Draw the picture in your notebooks starting at the center of the page. Imagine what the picture would look like if you continued the pattern.