TWO-STAGE PROBABILITY
INVESTIGATION
HOW MANY HANDSHAKES

At the school reunion, everyone at the reunion has to shake hands with everyone else once.
Your task is to work out how many handshakes there are for the number of people in the room at the reunion.

TASK 1
While she is waiting for the others to show up, Lucy works out how many handshakes there would be if only a few people show up.
Copy and complete the table below, filling in the numbers of handshakes.
(Hint: Draw diagrams to help you count the number of handshakes.)

Number of people in the room (n)	Number of handshakes (h)
1	
2	
3	

TASK 2
Lucy looks out the window and sees a long line of Chevvies approaching. It looks like there's going to be a big turn up. Good thing it's catered.
Lucy has figured out a pattern to the number of handshakes for different numbers of people at the reunion.
Using her rule, she adds to the table she had already drawn up.
Copy and complete the table below, filling in the missing numbers.
Show any working or diagrams that helped you get your answers.

Number of people in the room (n)	Number of handshakes (h)
10	
	91
	465

TASK 3
Lucy finally realized that if she had used her imagination earlier to figure out the rule, it would have saved her a lot of time.
Your task here is to find the rule that tells you the number of handshakes (h) that take place when there are any given number (n) of people at the reunion who shake hands only once with the others in the room.
Write this rule as the function $h = f(n)$
Explain how you arrived at this rule and how you know that it works.