Spies

Every Friday, six spies exchange all the information they have gathered during the week. A spy can never be seen with more than one other spy at the same time. So, they have to have several rounds of meetings where they meet up in pairs and share all the information they have at that point. This includes any information they have learned from other spies during a previous meeting round that day. Thus, if Spy Anne knows “a” and Spy Bob knows “b”, they are both able to share “a” and “b” with the next spy they meet.

Your tasks:

5 points: Work out a general formula you can use to calculate how many rounds of meetings would be required for any number of spies to share all their information with each other, such that all spies have all the information for that week.

3 points: Determine how many rounds of meetings are required in one week for five spies to share all their information with each other, such that all spies have all the information for that week.

2 points: Determine how many rounds of meetings are required in one week for six spies to share all their information with each other, such that all spies have all the information for that week.

Hint available: Deduct 2 points if requested.