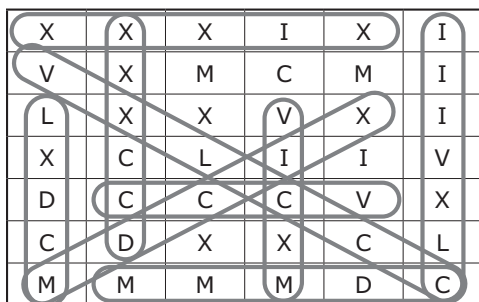
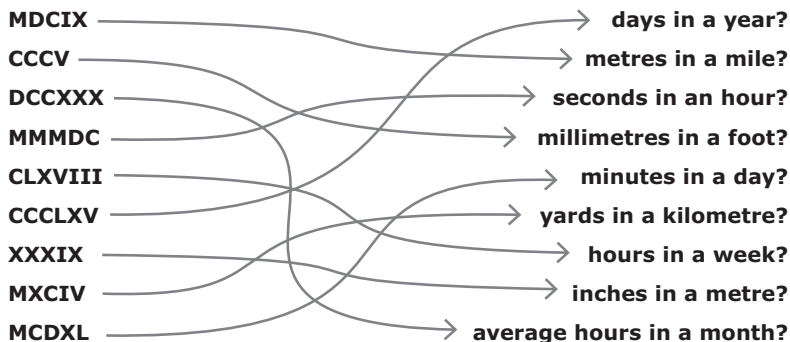


3 What the Romans did for us



The remaining letters, read in order, are MCMXIX, which is the year 1919, when GC&CS (now GCHQ) was founded.

4 Game, Set, Matchstick

a) You move a matchstick in the 2, to make it into a 3.

$$2 + 5 = 8 \qquad 3 + 5 = 8$$

b) You move a matchstick from the 8 to the 9, to make them 6 and 8 respectively.

$$9 - 8 = 2 \qquad 8 - 6 = 2$$

- c) You move a matchstick from the 8 to the 3, to make them 0 and 9 respectively.

$$\begin{array}{|c|} \hline 6 \\ \hline \end{array} - \begin{array}{|c|} \hline 5 \\ \hline \end{array} = \begin{array}{|c|} \hline 8 \\ \hline \end{array} \qquad \begin{array}{|c|} \hline 6 \\ \hline \end{array} - \begin{array}{|c|} \hline 6 \\ \hline \end{array} = \begin{array}{|c|} \hline 0 \\ \hline \end{array}$$

- d) You move a matchstick from the 8 to the 5, to make them 0 and 6 respectively.

$$\begin{array}{|c|} \hline 8 \\ \hline \end{array} + \begin{array}{|c|} \hline 5 \\ \hline \end{array} = \begin{array}{|c|} \hline 6 \\ \hline \end{array} \qquad \begin{array}{|c|} \hline 0 \\ \hline \end{array} + \begin{array}{|c|} \hline 6 \\ \hline \end{array} = \begin{array}{|c|} \hline 6 \\ \hline \end{array}$$

- e) You move a matchstick from the + to the 6, making them - and 8 respectively.

$$\begin{array}{|c|} \hline 6 \\ \hline \end{array} + \begin{array}{|c|} \hline 3 \\ \hline \end{array} = \begin{array}{|c|} \hline 5 \\ \hline \end{array} \qquad \begin{array}{|c|} \hline 8 \\ \hline \end{array} - \begin{array}{|c|} \hline 3 \\ \hline \end{array} = \begin{array}{|c|} \hline 5 \\ \hline \end{array}$$

- f) You move a matchstick from the 6, to form a - in front of the 4.

$$\begin{array}{|c|} \hline 4 \\ \hline \end{array} + \begin{array}{|c|} \hline 9 \\ \hline \end{array} = \begin{array}{|c|} \hline 6 \\ \hline \end{array} \qquad - \begin{array}{|c|} \hline 4 \\ \hline \end{array} + \begin{array}{|c|} \hline 9 \\ \hline \end{array} = \begin{array}{|c|} \hline 5 \\ \hline \end{array}$$

5 Filling in the Caps

- a) **ELEVEN (11)** is the number that uses only straight lines when written in digits or as a word. (The only digits available are 1, 4 and 7; but any number containing a 4 contains the letter O, and any number containing a 7 contains the letter S. We can only avoid using the O in ONE by using the number 11.)
- b) **FIVE (5)** is the smallest number that has no enclosed spaces when written as a word or in digits. (Each of ONE, TWO, THREE and FOUR contains either an O or an R.)

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