Chapter 1.
Problems I Like – *Michael Evans*

1. In magic squares, the sum of the numbers in each row, each column and each diagonal is constant. Find A, B, C, D, E in the following magic square.

15	A	35
50	B	C
25	D	E

2. (a) What two whole numbers, neither ending in zero, when multiplied together equal exactly 1 000 000 000?

(b) Repeat for 1 000 000 000 000 000 000.

3. Find three consecutive numbers such that the sum of the first and third is 18.

4. A *palindromic number* is a number which remains the same when the digits are reversed. For example, 14941 is a palindromic number. What is the next largest palindromic number ?

5. What two-digit number is twice the product of its digits ?

6. Find the values of the letters, each of which stands for a particular but different digit.

$$\begin{array}{cccccc} & F & O & R & T & Y \\ + & & & T & E & N \\ + & & & T & E & N \\ \hline & S & I & X & T & Y \end{array}$$

7. By replacing the asterisks with a selection of the four operational symbols $(+, -, \times, \div)$, complete this equation to make a true statement:

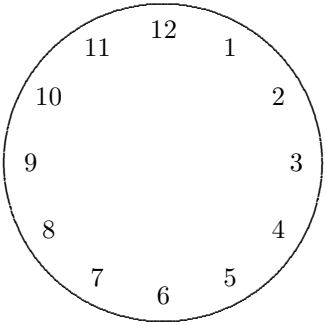
$$6 * 6 * 6 * 6 = 13.$$

8. A prime number is an integer greater than 1 whose only divisors are itself and 1. 1993 is a prime. What is the next year that is a prime?

9. What is the largest three-digit prime each of whose digits is a prime?

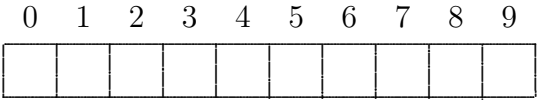
10. A perfect number equals the sum of its factors, excluding the number itself. Since $6 = 1 + 2 + 3$, 6 is a perfect number. Find another.

11. Divide the face of the clock into 3 parts with 2 straight lines so that the sums of the numbers in the 3 parts are equal.



12. A total of 642 digits was used in numbering the pages of a book. How many pages did the book contain?

13. In the cells shown, place a ten-digit number such that the digit in the first cell indicates the total number of 0s in the entire number, the digit in cell 1 indicates the number of 1s in the number and so on, to the last cell.



Now try Problem 1 in the Euler Student Problems Book.