YOU & MATHS **Licence plates** Some states, like California, in the USA issue some licence plates in the form 3ZMZ254. Each plate starts with a digit followed by three letters and then three more digits. Both the letters and digits may repeat, so 0MCX111 is a valid number. Which expression equals the maximum number of licence plates the state of California can issue using this scheme?

A $10^3 \cdot 26^4$

B 10^7

C $10^4 \cdot 26^3$

D $10^7 \cdot 26^7$

The letters in the alphabet are 26 and the digits from 0 to 9 are 10, so for the first number of the licence plate there are 10 possibilities, for the second place of the licence plate there are 26 possibilities, for the third place again 26 possibilities, for the fourth place 26, for the fifth place 10 possibilities, for the sixth place 10 possibilities, and for the seventh place 10 possibilities.
So the maximum number of licence plates is given by the product

$$10 \cdot 26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 = 10 \cdot 26^3 \cdot 10^3 = 26^3 \cdot 10^4.$$

The correct answer is C.