22. Consider numbers of the form $10n + 1$, where $n$ is a positive integer. We shall call such a number 'grime' if it cannot be expressed as the product of two smaller numbers, possibly equal, both of which are of the form $10k + 1$, where $k$ is a positive integer.

How many 'grime numbers' are there in the sequence 11, 21, 31, 41, ..., 981, 991?

A 0          B 8          C 87          D 92          E 99

22. **C** The numbers in the sequence 11, 21, 31, 41, ...., 981, 991 are of the form $10n + 1$ for $n = 1$ to 99. There are therefore 99 numbers in this sequence.

Twelve terms of this sequence can be expressed using factors of the form $10k + 1$. In this form, these terms are $11 \times 11$, $11 \times 21$, $11 \times 31$, ..., $11 \times 81$ and $21 \times 21$, $21 \times 31$, $21 \times 41$ and $31 \times 31$. All other pairings give products that are too large. Hence, there are $99 - 12 = 87$ 'grime' numbers.