16. A hockey team consists of 1 goalkeeper, 4 defenders, 4 midfielders and 2 forwards. There are 4 substitutes: 1 goalkeeper, 1 defender, 1 midfielder and 1 forward. A substitute may only replace a player of the same category eg: midfielder for midfielder. Given that a maximum of 3 substitutes may be used and that there are still 11 players on the pitch at the end, how many different teams could finish the game?

A 110 B 118 C 121 D 125 E 132

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16. B Firstly, we note that of the players on the pitch at the end of the game, the goalkeeper is one of two players; the four defenders form one of five different possible combinations, as do the four midfielders, and the two forwards form one of three different possible combinations. So, if up to four substitutes were allowed, the number of different teams which could finish the game would be $2 \times 5 \times 5 \times 3$, that is 150.
From this number we must subtract the number of these teams which require four substitutions to be made. This is $1 \times 4 \times 4 \times 2$, that is 32, so the required number of teams is 118.