1094-52-69 **Pierre YOUSSEF*** (pierre.youssef@univ-mlv.fr), Edmonton, Alberta , Canada. *A short proof for an upper bound of the Banach-Mazur distance to the cube.*

If $X, Y$ are two $n$-dimensional Banach spaces, the Banach-Mazur distance between $X$ and $Y$ is defined as follows:

$$d(X,Y) = \inf\{\|T\| \cdot \|T^{-1}\| \mid \ T \text{ is an isomorphism between X and Y } \}$$

In a very important result, John proved that for any $n$-dimensional Banach space $X$, we have $d(X, l_2^n) \leqslant \sqrt{n}$. A natural question is to estimate the distance between an $n$-dimensional Banach space and $l_\infty^n$. Bourgain-Szarek'88, Szarek-Talagrand'89 and Giannopoulos'95 studied this problem obtaining respectively $o(n)$, $cn^{\frac{7}{8}}$ and $cn^{\frac{5}{6}}$ ($c$ being of the order of 3). Using a different approach, we provide a short proof of the last result improving the constant involved. The main ingredient is a normalized restricted invertibility principle. Precisely, we prove that the Banach-Mazur distance between an $n$-dimensional Banach space and $l_\infty^n$ does not exceed $(2n)^{\frac{5}{6}}$. (Received August 09, 2013)