Some Basic Results of Caputo Fractional Differential Equations. Preliminary report.

We have developed some basic results for fractional differential equations of order $q$ and $2q$, when $0 < q < 1$. We have obtained a symbolic closed form of the solution for Caputo initial value problem of order $q$, when $0 < q < 1$, such that the classical result for $q = 1$ will be a special case. We bring in the salient difference between the oscillatory solutions obtained using the Mittag-Lefler function and the oscillatory solutions of ordinary differential equations. As a byproduct some new properties of Mittag-leffler functions are also established which is useful in applications. Several numerical results are presented. (Received September 11, 2014)