

1096-01-1544 **mustafa r.s. kulenovic***, university of rhode island, kingston, RI 02881. *Sharaf al-Tusi (1135-1213): the grandfather of Differential Calculus ?* Preliminary report.

We argue that Sharaf al-Tusi (1135-1213) can be considered as grandfather of Differential Calculus. Without using the coordinate system he made perfect use of the derivative of cubic polynomial to find the necessary and sufficient conditions for cubic equation to have one, two or three real roots. In doing so he discovered the discriminant of the cubic equation. His method can be easily extended to quartic equation to obtain the necessary and sufficient conditions for quartic equation to have one, two, three or four real roots. These conditions are of great importance in contemporary stability theory of differential and difference equations. (Received September 16, 2013)