1096-35-2483 **A. Bass Bagayogo*** (abagayogo@ustboniface.ca), 200 de la cathedrale, Winnipeg, Manitoba R2H 2T7, Canada. *Symbolic Solutions For Radial-Symmetric and Axial-Symmetric Groundwater Flow in Term of Special Functions.* Preliminary report.

Groundwater makes up nearly 30% of the entire world's freshwater but the mathematical models for the better understanding of the system are difficult to validate due to the disordered nature of the porous media and the complex geometry of the channels of flow. In this talk I will first establish the general 3D groundwater equations as expressed in Eqs. (1)

$$\frac{\partial}{\partial x}\left(K_x\frac{\partial h}{\partial x}\right)+\frac{\partial}{\partial y}\left(K_y\frac{\partial h}{\partial y}\right)+\frac{\partial}{\partial z}\left(K_z\frac{\partial h}{\partial z}\right)=S_s\frac{\partial h}{\partial t} \tag{1}$$

Where:

h = the hydraulic head

K = the hydraulic conductivity

$S_s = \rho g(\alpha + nB)$, the specific storage, with:

α = the compressibility of aquifer

B = the compressibility of the water

ρg = the specific weight of the water

By transforming the Eqs. (1) in different coordinate systems and by using the modern Computer Algebra System, I will show that dependant of the initial and boundary conditions, the solutions of Eqs. (1) could be expressed in term of special functions like Bessel, Error, Polder, Airy, Henkel and others related special functions. These functions are of considerable importance for solutions of radial-symmetric and axial-symmetric flow. (Received September 17, 2013)