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The Boussinesq equation describes water flows in unconfined groundwater aquifers under the Dupuit assumption that the equipotential lines are vertical, making flow horizontal. It is a nonlinear diffusion equation with diffusivity depending linearly on water head. The generalized Boussinesq equation or porous medium equation is an equation where the diffusivity is a power law function of water head. For certain types of initial and boundary conditions similarity reduction is possible. Here we construct approximate analytical solutions that respect the scaling properties of the equations. (Received March 03, 2020)