Gas dynamics

1. Explain the formation of shock wave from a series of small compression waves! What are the major characteristics of shocks?
2. Derive relations between the Mach number (M) and temperature ratio (T/T_t), pressure ratio (p/p_t), density ratio (rho/rho_t) and dimensionless channel cross-section (A/A*) for an isentropic flow!
3. Derive the quadratic equation for the square of upstream and the downstream side Mach numbers from the conservation lows applied to a steady normal shock!
4. Draw qualitatively correct graphs of the pressure, density, temperature, Mach number and stagnation pressure ratios for a normal shockwave!

Dr. Gergely Kristóf
associate professor
Department of Fluid Mechanics
kristof@ara.bme.hu