NE 795 Assignment 1

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Question 1

Show that

$$I_\nu = ch\nu\psi_\nu.$$

Question 2

Show that the equilibrium intensity is equal to

$$I_\nu = B_\nu = \frac{2h\nu^3}{c^2}\frac{1}{e^{h\nu/kT}-1}.$$

Question 3

Moments ...

Question 4

Derive the speed of radiation wave in vauum in the radiative transfer (RT) model defined by

- The grey time-dependent P_1 equations
- The grey time-dependent $P_{1/3}$ equations

Question 5

Derive the system of the time-dependent P_1 and MEB equations in multigroup form from the spectral P_1 and MEB equations given by ...

Note that as part of this derivation you will need to define group opacities in the multigroup photon balance, first moment, and MEB equations.