Q2P1

Submit Assignment

Due Friday by 2:15pm   **Points** 50   **Submitting** a file upload   **File Types** pdf

Available Mar 19 at 1:25pm - Mar 19 at 2:25pm about 1 hour

Show detailed steps for the parts below.

(a) An explosion of energy E sends out a spherical shock wave into the surrounding air of mass density ρ. Use dimensional analysis to derive the shock front radius R as a function of time t since the setoff of the explosion. A result without any dimensionless factor is sufficient. (25 points)

(b) Consider the Hermitian operators S_1, S_2, S_3 that satisfy $[S_i, S_j] = i \sum_{k=1}^{3} \epsilon_{ijk} S_k$. Show that $S^2 = S_1^2 + S_2^2 + S_3^2$ commutes with each of these three operators. (25 points)