Physics 262: Homework 15
4 points

Problem 1 (1 point)

Show for N=2 and N=3 that the bionomial expansion, $(1+\epsilon)^N \approx 1 + N\epsilon$ is valid for $\epsilon \ll 1$. Can you think of a way to show this when N is negative or not an integer?

Problem 2: (1 point)

Show and explain why $\Delta\phi = \frac{2\pi c}{\lambda}(t_2 - t_1) = \frac{2\pi}{\lambda}(r_2 - r_1)$.

Problem 3 (1 point)

For the Michelson interferometer, show the relationship between a phase shift due to path or time difference and an observed fringe shift at the detector.

Problem 4 (1 points)

Draw a Minkoski Diagram and show two events that happen at the same time in the spaceship frame, but at different times in the lab frame.