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The Speed Of Light C= 1. Greek Indices ( $\mu$ ,  $\nu$ , Etc., Which Take The Range {0,1,2,3}) Will Be Used To Represent Components Of Tensors. The Einstein Summation Convention Is Assumed: Repeated Upper And Lower Indices Are To Be Summed Over Their Ranges, E.g.,  $A\mu B \mu \equiv A0B0 + A1B1 + A2B2 + A3B3$ . Four-vectors Will Be Represented With 2th, 2024

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R Y R R Y  $\partial$   $\partial$  =  $\rightarrow$ 0 Now: Y R R C GM Rc GM C Y R R R V Y R Y V  $\partial$   $\partial$  - =  $\partial$   $\partial$   $\partial$  =  $\partial$   $\partial$   $\partial$  =  $\partial$   $\partial$  2 2 2]) 2 ([1, From Which: R C GMR R R R C GM Y R R C GM Y V Y Y 2

3 0 2 0 2 2 2 Now, We Calculate The Difference Between The Paths Dx And Dx' Of Wavefronts At A Vertical Distance Y And Y+dy, At Which 4th, 2024

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A. Gauge Transformations; Gauge-invariant Variables In At Spacetime (or In A Locally Inertial Coordinate System) Maxwell's Equations Are J = @ F @ (@ A @ A) = A @ @ A; @ @ ; (1) Where A Is The 4-vector Potential, De Ned By F = 2@ [A]. A Priori There Are 4 Degrees Of Freedom In This Theory, The 4 Components Of A . 2th, 2024

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U0 = 1 + Gx Where Gis A Constant. (a) Please Compute U1 And V As A Function Of U0. Please Leave Your Answer (for This Part) In Terms Of U0; No Need To Expand Out The Relation Explicitly. Sol. We Simply Compute: U1 = P 1 + (U0)2 = P 2gx + G2x2 And Thus: V = U1 U0 = P 2gx + G2x2 1 + Gx (b) Calculate V(x) In The Limits Of X!0 (to Lowest Non-vanishing ... 3th, 2024

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