

1. SR 6.3
2. SR 6.4
3. SR 6.5
4. Let $\kappa(s)$ be a function on \mathbb{R} and let

$$\phi(s) = \frac{1}{c} \int_0^s \kappa(r) \, dr. \quad (1)$$

Show that

$$\alpha(s) = c \int_0^s (\cosh(\phi(s)), \sinh(\phi(s))) \, ds \quad (2)$$

is parameterized by proper time and has a 4-acceleration with size $|\kappa(s)|$. What does the sign of κ tell you?

5. Using some kind of computer technology, generate a graph of a curve in spacetime with acceleration

$$\kappa(s) = \sin(s) \quad (3)$$

over the interval $s \in [0, 2\pi]$.

6. SR 7.1