

General Relativity Cheat Sheet

Light Speed:

$$\frac{dr^2}{dt^2} = \left(1 - \frac{r_s}{r}\right)^2 c^2$$

Sub-light Speed:

$$\frac{dr^2}{dt^2} = \left(1 - \frac{r_s}{r}\right)^2 c^2 - \left(1 - \frac{r_s}{r}\right) c^2 \frac{d\tau^2}{dt^2}$$

Stationary:

$$\frac{d\tau^2}{dt^2} = \left(1 - \frac{r_s}{r}\right)$$

Newtonian Free Fall:

$$\frac{d\tau^2}{dt^2} = \left(1 - \frac{r_s}{r}\right) - \frac{r_s}{r \left(1 - \frac{r_s}{r}\right)}$$

Relativistic Free Fall:

$$\frac{d\tau^2}{dt^2} = \left(1 - \frac{r_s}{r}\right) - \frac{r_s \left(1 - \frac{r_s}{4r}\right)}{r \left(1 - \frac{r_s}{r}\right)}$$

Constant Velocity:

$$\frac{d\tau^2}{dt^2} = \left(1 - \frac{r_s}{r}\right) - \frac{v^2}{c^2 \left(1 - \frac{r_s}{r}\right)}$$