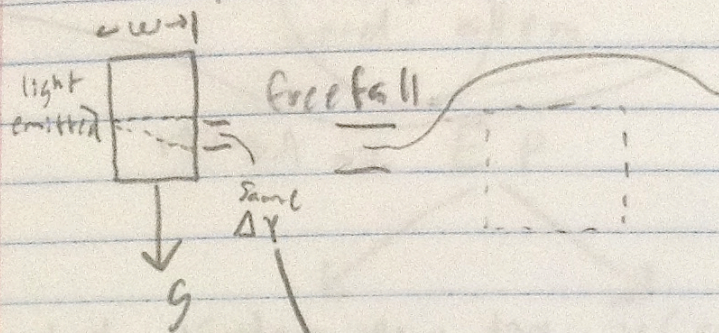
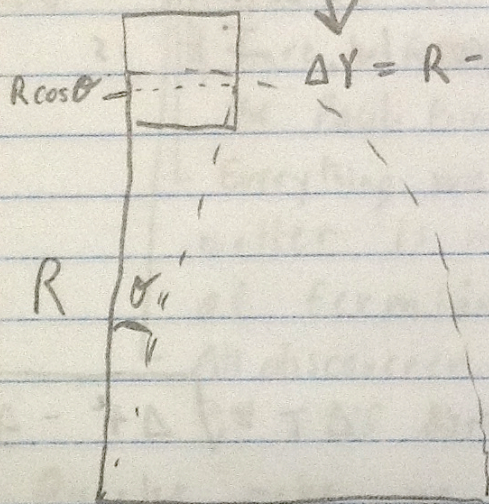


Quiz and everything showed on the board today is on the class homepage



$$\Delta Y = -\frac{1}{2} g \left(\frac{w}{c} \right)^2$$

fallen by this amount



$$\Delta Y = R - R \cos \theta \quad \text{width } w = R \theta$$

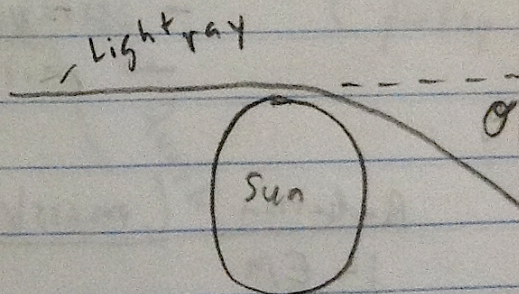
Taylor expansion of $\cos \theta$

$$\cos \theta = 1 - \frac{1}{2} \theta^2 + \dots$$

Higher order terms

$$\Delta Y = \frac{\frac{1}{2} g \left(\frac{w}{c} \right)^2}{w} = \frac{\frac{1}{2} R \theta^2}{R \theta}$$

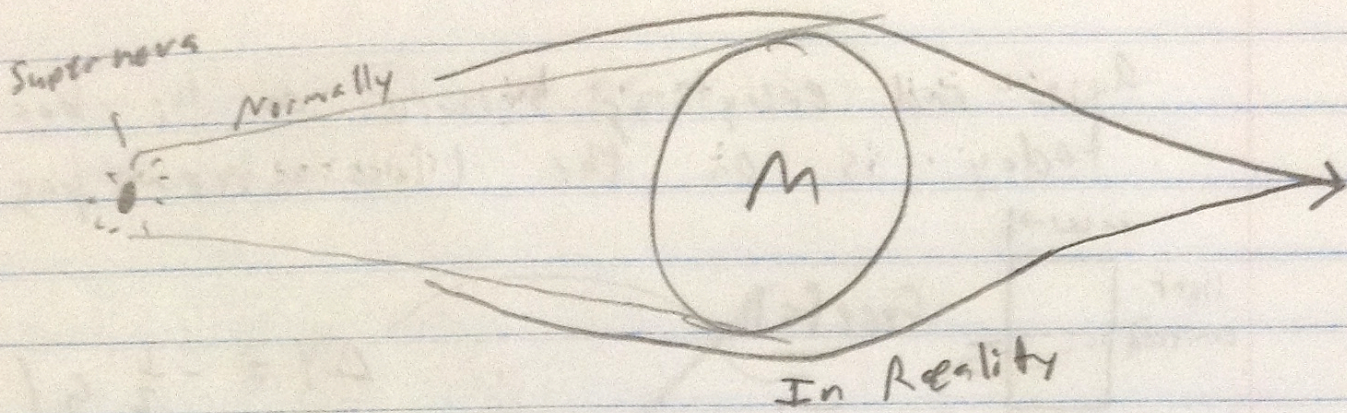
$$g \frac{w}{c^2} = \theta$$



Sun (Surface)

$$g \approx 270 \frac{\text{m}}{\text{s}^2}$$

$$\frac{g w}{c^2} \approx \frac{1500 \text{ m/s}}{c} = 5 \times 10^{-6} \text{ radians} \approx 1''$$



Straight line is not well defined but can be replaced by the shortest distance of 2 different points. It is called a geodesic

In special relativity:

$$\text{proper time } \Delta T = \sqrt{\Delta t^2 - \frac{\Delta r^2}{c^2}}$$

Particle Physics

- 3 Types of info carriers
- Electromagnetic Radiation
 - Gravity waves
 - material Objects