A gun is fired up the slope as in the figure. Show that the range measured along the slope is given by

\[ L = \frac{2V_0^2}{g} \frac{\cos^2 \theta}{\cos \alpha} (\cos \theta - \tan \alpha) \]

Two bullets are fired from the origin simultaneously with the same speed, but with different elevation angles \( \alpha \) and \( \beta \). Discuss the possibility that the two bullets can ever collide while in flight.

A particle moves in the xy plane so that its position vector as a function of time in SI units is

\[ \vec{r}(t) = t \hat{i} + 4t^2 \hat{j} \]

What is the equation of its trajectory?