Answer on Question #68355-Physics-Mechanics-Relativity

A particle is falling the height of 100m and another particle is throwing upwards the same line like first particle the velocity of 50m/s tell about the position where both particles are meet?

Solution

The height of the 1st particle:

$$h - \frac{gt^2}{2}$$

The height of the 2nd particle:

$$vt - \frac{gt^2}{2}.$$

Thus,

$$h - \frac{gt^2}{2} = vt - \frac{gt^2}{2}.$$

$$h = vt.$$

Thus,

$$t = \frac{h}{v}.$$

The position is

$$s = h - \frac{g}{2}\left(\frac{h}{v}\right)^2 = 100 - \frac{10}{2}\left(\frac{100}{50}\right)^2 = 80\ m.$$

Answer: $80\ m$.