The problem goes like this: If you throw an object upward, and you know that it reaches 50% of its maximum height after 2 s, what is the maximum height.

So we know: Acceleration: $-9.8 \frac{m}{s^2}$ and time: $2s = 0.5y$

Maximum height equals: $\frac{v^2}{2} = gh$

Time needed to reach 50% of maximum height: $\frac{h}{2} = vt - \frac{gt^2}{2}$

So, we have system of equations:

$$\begin{cases} \dfrac{v^2}{2} = gh \\ \dfrac{h}{2} = vt - \dfrac{gt^2}{2} \end{cases}$$

Or:

$$\begin{cases} v = \sqrt{2gh} \\ h = 2vt - gt^2 \end{cases}$$

Substitute (1) equation to second:

$$h - 2\sqrt{2g}t\sqrt{h} + gt^2 = 0$$

We have quadratic equation with roots:

$$\sqrt{h} = \frac{2\sqrt{2g}t \pm \sqrt{(2\sqrt{2g}t)^2 - 4gt^2}}{2} = \frac{\sqrt{2g}t \pm \sqrt{gt^2}}{1} = \sqrt{g}t(\sqrt{2} \pm 1)$$

Or for height:

$$h = gt^2(3 \pm 2\sqrt{2}) = 9.8\frac{m}{s^2} * 4s^2(3 \pm 2\sqrt{2})$$

$$h_1 = 228 \, m$$

$$h_2 = 6.7 \, m$$

Answer: 228 or 6.7 m