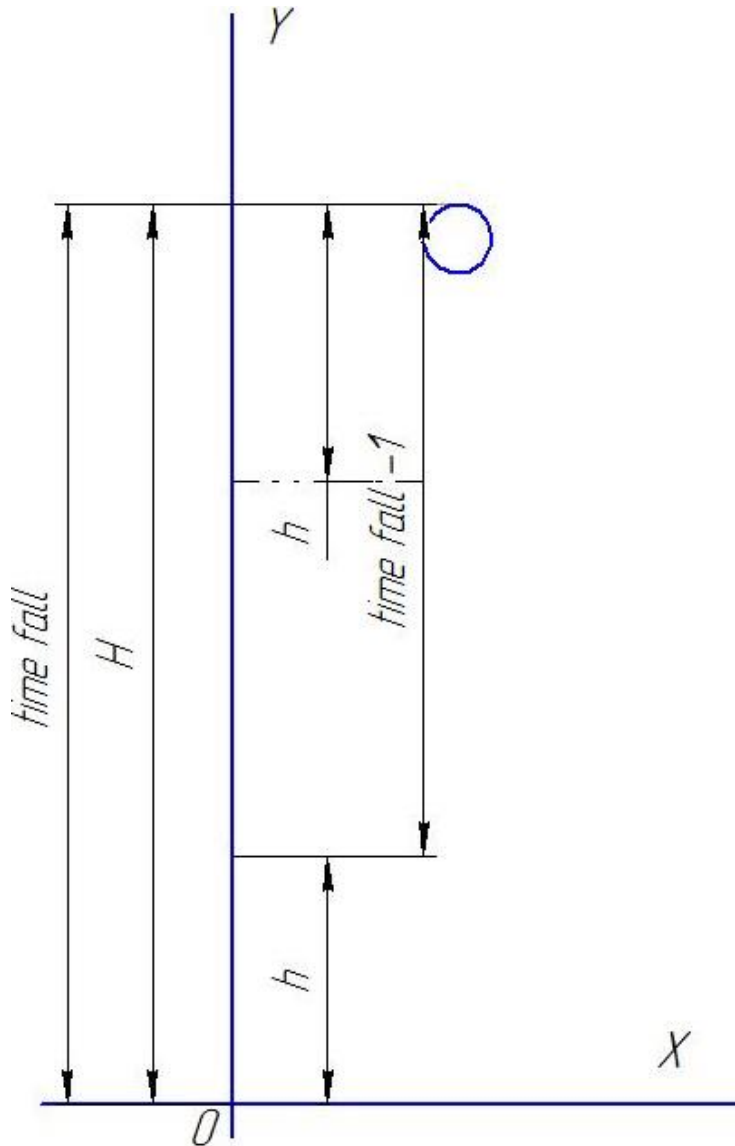A body falls freely from rest.It covers as much distance in the last second of it's motion as covered in the first three seconds.What is the time taken by the body to reach the ground?

Input data: $t_1 = 3\ s; t_2 = 1\ s\ ;\ h_1 = h_2$

The general equation:

$$y = H - \frac{gt^2}{2}$$

When the body reached the ground y=0 and $t_{fall} = \sqrt{2H/g}$

For the first three seconds the body goes the distance

$$h_1 = H - \frac{gt_1^2}{2}$$

For the first second before falling body passes away

$$H - h_2 = H - \frac{g(t_{fall} - 1)^2}{2}$$

Since $h_1 = h_2$

$$H - \left(H - \frac{gt_1^2}{2}\right)$$
$$= H$$
$$- \frac{g(t_{fall} - 1)^2}{2}$$

And $t_{fall} = \sqrt{2H/g}$ -> $H = \frac{gt_{fall}^2}{2}$

We get

$$\frac{gt_1^2}{2} = \frac{gt_{fall}^2}{2} - \frac{g(t_{fall} - 1)^2}{2}$$

Whence

$t_{fall} = (t_1^2 + 1) * 0.5 = 5\ sec$

Answer 5s