Answer on Question #62563

A body takes 5 seconds to reach ground from a certain height if it is stopped at 3rd second of it's journey and then thrown back what time will it take to cover the remaining distance?

Solution:

The height from the ground could be calculated using formula

$$H = gt^2/2,$$

where g – acceleration due to gravity (near 9.8 m/s^2), t – time in sec, H – height in m.

If body takes 5 second to reach ground, then the whole height is $gt^2/2 = 25g/2$.

If the body is stopped at 3 s, then the height it falls before stop is $gt^2/2 = 9g/2$.

Remaining distance = (whole height) – (height before stop) = $25g/2 – 9g/2 = 16g/2 = 8g$.

Let's substitute this height to the above formula, and solve equation for t:

$$8g = gt^2/2$$

$$8 = t^2/2$$

$$16 = t^2$$

$$t = 4 \text{ s}$$

Answer: It takes 4 s to cover the remaining distance.