

### Answer Question #42741-Physics-Mechanics-Kinematics-Dynamics

What is the formula for

1. Time of flight?
2. Time taken to fall?
3. Motion under gravity?

#### Answer

1. Time of flight is

$$t = \frac{2v_0 \sin \theta}{g},$$

where  $v_0$  is the initial velocity,  $v_0 \sin \theta$  is the component of initial velocity along y-axis,  $g$  is the acceleration due to gravity.

2. Time taken to fall is

$$t = \sqrt{\frac{2h}{g}},$$

where  $h$  is initial height of a body,  $g$  is the acceleration due to gravity.

3. The equations of motion under gravity

$$\begin{cases} v = u - gt \\ s = ut - \frac{gt^2}{2} \end{cases}$$

where  $v$  is final velocity,  $u$  is initial velocity,  $t$  is time,  $g$  is acceleration due to gravity,  $h$  is height from ground.